RAILROAD GAZETTE

FRIDAY, MARCH 3, 1899.

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Contributions.

Steel Boiler Tubes.

637 Prospect Street,
Cleveland, O., Feb. 27.

To the Editor of the Railroad Gazette:

Referring to a communication signed "R. P. C. Sanderson," page 135, Railroad Gazette of Feb. 24, 1899, wherein he states: "That if steel manufacturers can show that steel tubes can be welded as readily as soft knobbled iron flues, and that they will not become hard and brittle by long use, there is a better chance of steel flues being taken up in locomotive practice."

In reply to Mr. Sanderson's letter, the writer claims it to be nothing against steel, because marine practice in the maintenance of boilers does not permit the welding of tubes. I well remember the serious objections raised by locomotive builders, as well as users, when steel boiler plate was first taken up in the construction of fire boxes for locomotives. What else but steel is used at this time in the construction of locomotive boiler shells, side, back, crown and flue sheets included? In railroad practice, where the questions of economy demand the use of flue ends of a material that will readily weld to the old flue we hear the same objection to steel.

There certainly can be no valid objection to the use of steel produced under modern processes, when it is a well known fact that seamless cold drawn steel tubes are being produced to-day from material of a quality that will not only readily weld to steel, but just as readily to knobbled or other iron used in the manufacture of first class locomotive boiler tubes. To verify the foregoing statements, the writer will at any time take pleasure in demonstrating to those interested that steel can be welded as claimed, by having the work performed in their presence, or by furnishing samples of welding already done by a practical locomotive boiler maker now in the employ of a trunk line railroad, in charge of one of their largest locomotive repair shops.

As to this metal becoming hard and brittle in long use, that theory has been exploded long ago by actual demonstration by the use of tubes produced from this metal and used on a vessel of the United States Navy.

It might be of interest to some of your readers who are looking to the economical maintenance of locomotive boilers to investigate the make-up of this class of metal as shown by its analysis, as well as the modern methods adopted in the production of steel used in the manufacture of seamless cold drawn boiler tubes mentioned by Engineer-in-Chief Melville of the United States Navy in his annual report referred to by Prof. Goss, who is quoted by Mr. Sanderson.

The writer will take pleasure in furnishing all information necessary to verify all claims made for steel used in the manufacture of seamless cold drawn boiler tubes for marine, locomotive or other use.

WILLIAM THORNBURGH.

The Distant Signal.*

In order to see how we may expedite traffic with absolute safety, take a supposed installation, which, while a very difficult one, shall yet be perfectly possible.

Suppose a grade crossing at the foot of a long descending slope, approached by a long ten-degree curve to the right, through a heavy growth of timber, near a large stream with swampy banks. The grade is just easy enough to allow heavy freight trains to attain express speed. The ten-degree curve and the dense timber make it impossible to see a signal more than 400 ft. away, and the heavy fogs that pervade the valley every chilly night and morning during the spring and fall render everything quite invisible, until within 50 ft.—often less. The character of the traffic is such that it would never do to impose a speed on freights that would permit a stop in 50 ft. after seeing the home signal; nor would it answer to allow the fast mail and the limited to crawl down that slope at a rate slow enough for even the "emergency" to hold them in 50 ft. The almost unvarying regularity with which they get the crossing, owing to the infrequency of trains on the opposing road, also becomes a factor in the problem, rendering it all the more imperative that due notice should be given when a stop is necessary.

The needed distance between the home and distant signal must be equal to that within which the regular freight trains could be brought to a stand on that grade, say, 2,500 ft. This was allowing for the maximum train, with half air and two lively men on the rear portion. The derail 500 ft. from the crossing means over 3,000 ft. from the tower to the distant signal. This, combined with the sharp curve, made it very doubtful whether a good clear action could be secured with a mechanical signal; hence it was decided to use an electric semaphore of the motor type; and as distance made so little difference in its operation, it was placed 1,000 ft. further up the hill, thus giving an actual distance of 3,500 ft. for the heaviest trains to stop in.

As it was quite imperative that this signal should always be cleared when possible, an annunciator was put in, with its section of track one and a half miles beyond the distant signal, the extra distance being needed by reason of the towerman's frequent absence from the lever room, he having to care for the lamps and the outside connections. A still further reason for the annunciator was the difficulty in judging the direction of sound, owing to the sharp curve and dense wood. Should too many unnecessary delays occur to irregular trains, a still further precaution will be taken by a train-describer, worked by the operator at the next station, making it as near certain as possible that the towerman will know in time of the approach of a train.

This signal is controlled by a circuit through the track from the home signal on, which also passes through a breaker on the home blade, and is worked by a closing contact mounted on the locking frame, so that the last half of the reverse stroke of the home lever's latch completes the circuit, providing the home blade is reasonably close to a perfectly clear position, on which account it is made pipe-connected.

As the signal is entirely invisible from the tower, there is a back indication, or repeater, controlled by a closing contact on the blade, that takes effect during the last fifth of the stroke. The advisability of a tell-tale for the lamp was considered, but as the lamp was the globe-ventilator pattern, with all the in-draft at the top of the body, and extra well cared for the probability of its being out was so remote that it has not been put on.

The special reason for putting the controlling circuit through the track was to enable the towerman to clear the home signal for a train that had been held at the crossing, and yet be in no danger of showing a clear distant to a closely following train, unless he was ready to let it pass.

Having, so far as possible, insured that the distant signal should be always operated, it became necessary to provide against the chance of the towerman getting confused and changing the route after an engine had passed the distant at clear. To accomplish this, there was an electric lock placed on the facing-point lock lever, controlled by an interlocking relay, so arranged that the lock took effect as soon as the train came to a short track section just beyond the distant signal, and was withdrawn when the last car had passed off a similar section just beyond the trailing derail (beyond the crossing). The hand-release with this lock consisted of a slow screw, which on its last turn closed a local circuit on the lock, the time required to operate it being more than enough to allow a train to pass from the distant signal to the crossing. The screw was held in its normal position by a seal which, when broken, could only be restored by the inspector. It was also interlocked with the machine locking, so that it could not be operated unless the signals were all at danger, and had to be put entirely normal again before any of the signals could be cleared.

The above outlines a satisfactory installation at a very difficult location, and seems to successfully solve the problem of giving correct information in advance of the position of the home signal. If in the horizontal position its indication means to use caution, as the home signal may be at danger; and if at clear, then the home signal must be at clear, also.

What weak points are there in such an installation? What better arrangement to suit the conditions would it be practicable to use?

The most radical advocate of fixed distant signals [a signal with an immovable arm], would surely be unable to claim either expedition or safety in the use of one at such a place. In short, a fixed distant signal can never expedite traffic, as you must always approach a home signal at such a speed as will allow you to stop at it after seeing it, whether that distance be 5 ft. or 5,000 ft., unless you have other means of knowing that it is clear.

Had the alignment been straight, and the extra distance less valuable, the problem would have been met by a mechanical solution using the regular distant signal on a separate lever, with a multiplier either at the tower or the post; possibly both, for under favorable conditions such signals can be successfully worked as much as 4,000 ft. from the tower.

Any mechanical distant signal on a separate lever should always work through a wire lock at the derail, though that is not so essential if the home is pipe-connected and bolt-locked with the derail; and perfect safety can seldom be secured without the application of electric locking, combined with the slow hand release under seal.

Though it is seldom desirable to give to an interlocking signal any of the characteristics of the block signal, unless combined with Sykes' locking, should the same effect be desired as was secured by the track circuit on the signal just described, it may be had by the use of an electric slot, or even a mechanical slot, with a track treadle. A still cheaper device would be a short loop on the annunciator circuit connected to a couple of rails just beyond the signal, with a rule that the towerman should put the lever normal as soon as contact ceased on the loop.

Another extreme case—almost the opposite of the one just disposed of—is where there is lack of space for the machine, as in the engine room of a drawbridge, rendering separate levers for the distant signals quite impossible, which was met by making the home signals pipe-connected, with an extra long balance lever, to which the distant wires were connected, thus working the two signals tandem off the home lever. It is on perfectly straight track, not far from a stop-crossing; hence the speed is always low, and the accessories of electric locking and annunciator were not considered necessary. It has so far given perfect satisfaction in every way.

Another type of distant signal in frequent use, is where the home and distant were put in tandem with the old home and distant movement. These were very difficult to keep in good adjustment, especially when much worn, and they are fast being replaced with plain balance levers, making them simultaneous instead of successive, but much more positive in action, with no difficulty to speak of in adjustment.

Another form of distant signal that was frequently used several years ago was that connected with what is known as the wheel machine, the only peculiarity worthy of mention being that as usually connected it was a continuous run from the tower through the motion plate to the distant pole and back, the home signal being worked by a loop off the distant wire, thus rendering it possible for the home signal to break loose and be at danger with a clear distant. The situation, however, would not be dangerous, as the motion plate at the derail has to complete its work before either of the signals can be clear. While these wheel-machine plants are very simple in every respect, and, if carefully watched, are very safe and seem to be endowed with the proverbial nine lives of a cat, they are quite unpopular, and I have yet to find any one who is not glad to be rid of an old plant.

The almost universal connection to a distant signal in Europe is a single line of wire cable, depending entirely upon a weight to carry the signal back to normal, which, being quite heavy, requires a corresponding counterweight on the lever tail to enable the towerman to operate it. While this has a very dangerous appearance, it must have proven fairly satisfactory to be continued, and one prominent road on this side has a couple on trial. The other extreme from a single line of wire is a pipe-connected distant, a few of which are being tried. At first thought they would seem unreasonably expensive, but actual experience may possibly prove the reverse.

There is a point in connection with the use of any two-line wire-connected signal that has so far received very little attention, yet becomes quite important on long lines to distant signals. It is the possibility of the back wire breaking and allowing the unbalanced strain of the front wire to pull the signal clear. This may easily be corrected by a tripping device, which casts off the front wire if the back one gives way, but otherwise holds everything solid. A clever form of this is in use on the C. M. & St. P.

I sent a list of questions, requesting information, to all the trunk lines of the United States and Canada and several roads in England, but only twenty-two roads replied, and few of those replying gave the number of each type of signal in use, but I will give those who did answer the benefit of the following summary of what was received:

Eleven roads have in use fixed distant signals [signals with immovable arms]. As to whether they had

* A paper by E. D. Wileman, of the Lake Shore & Michigan Southern Railway, read before the Railway Signaling Club at Philadelphia.

been erected as such, or changed to fixed from some other form, the answers are not all definite.

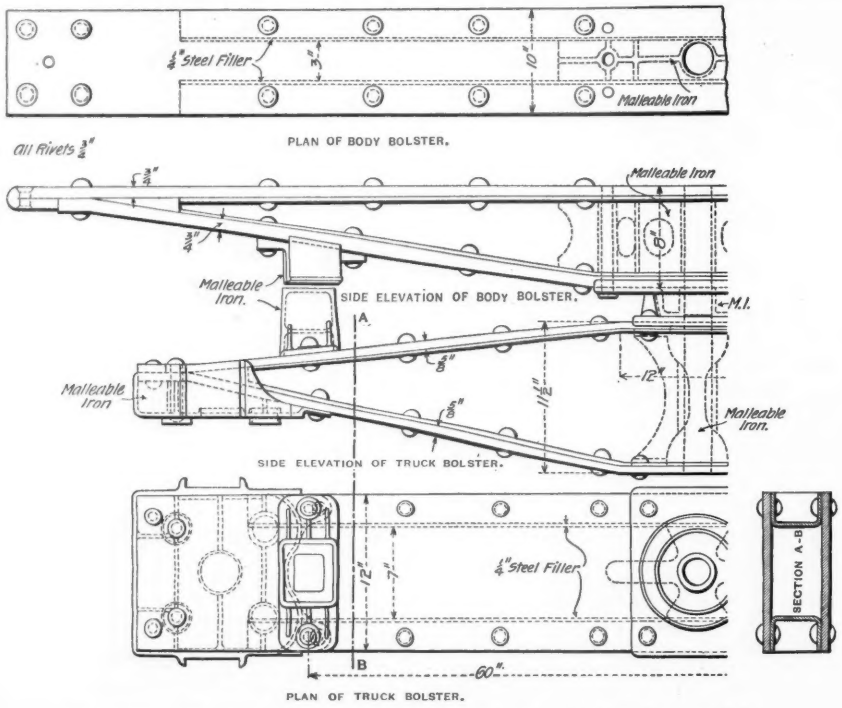
Eleven roads have repeaters on distant signals that are not visible from the tower—only three, however, saying that they use them at all such places.

Only 7 out of the 22 use wire locks on the distant signals, while 2 reply that they are unnecessary by reason of their using separate facing-point locks.

Ten roads are using some form of tandem distant signal, but the answers are not clear enough to venture on details.

Two roads have pipe-connected distants, though one of them has only one example.

Five roads are using distant signals, with a single line of wire connections. Only one of these, however, is in the United States, and that only two



The "Common Sense" Body and Truck Bolsters for 80,000 Lbs. Capacity Cars

signals, by way of experiment. The maximum distance from home to distant varies from 785 to 3,200 ft. and the minimum ranges from 250 to 1,800 ft.

Ten roads have some form of electric locking, but the replies are not very definite as to the manner of its application.

Eighteen roads have some form of announcement in use, but only one states definitely that it uses annunciators at all crossings.

Eighteen roads make some use of detector bars at crossings to assist in holding the route, but nearly all the replies are quite indefinite as to details.

Five roads make no reply to the question regarding the number of distant signals maitained, but the number given aggregate over 6,200.

Two roads give a maximum distance from tower to distant of 4,200 ft., while four more exceed 3,000 ft.

There were so few replies to the question regarding the distance for stopping the maximum train on the steepest descending grade that a summary would have no value.

New Metal Bolsters for Freight Cars.

The accompanying engraving shows the design of metal body and truck bolsters for 80,000 lbs. capacity cars recently put on the market by the Common Sense Bolster Company, Fisher Building, Chicago. The body bolster is a truss, 8 in. deep at the centre, with upper and lower plates of open hearth steel, ¾ in. thick, by 10 in. wide, between which are placed two flanged ¼ in. steel fillers of channel section. The fillers are spaced 3 in. apart, and are riveted to the upper and lower members, while between the fillers at the centre is a malleable iron spider casting.

The truck bolster is of similar construction, 11½ in. deep at the centre, and made of ⅝ in. by 12 in. upper and lower plates. Steel fillers, spaced 7 in. apart, are used, and the end castings and centre spider casting, as well as the side and centre bearings, are malleable iron.

The same body bolster is used for either 60,000 or 80,000 lbs. capacity cars, and weighs 600 lbs.; for 60,000 lb. cars the upper and lower plates of the truck bolster are made ½ in. instead of ⅝ in. thick, so that the truck bolster weighs 625 lbs. for cars of 80,000 lbs. capacity, and 600 lbs. for 60,000 lb. cars. Quite a number of these bolsters are now in use, and we are told no failures have been reported.

The Railway Signaling Club.

The annual meeting of this club was held at Philadelphia, Pa., on Tuesday, February 21. In the absence of the President, Vice-President W. H. Elliott (C., M. & St. P.) occupied the chair. About 20 members were present. The Chairman made a brief statement of the financial condition of the club, which is at present very low, but arrangements have been made for the publication of the proceedings of the past year, and it is expected to soon send copies of these to all members. The unfavorable financial condition, and the lack of interest on the part of some members in the affairs of the club appear to have been due in large measure to the inefficiency of the past secretary. But the members present at Philadelphia evinced a determination to work energetically for the prosperity and usefulness of the club, and it seems likely that it will now take a new start.

The first paper before the meeting was that of Mr. E. D. Wileman (L. S. & M. S.) on the Distant Signal, which is published in another column of this paper.

The discussion on Mr. Wileman's paper took a wide range. Mr. Henry Johnson, who was not present, sent a letter discussing various features of distant-signal practice. Mr. Johnson urges the use of electric repeaters for every distant signal, to give both audible and visual notice, in the cabin, of the position of the signal. He advocates the use of trips, which, when the back wire breaks, shall release the front wire so that the signal will surely go to the stop position.

Mr. Rhea (P., C., C. & St. L.) spoke of the advantages of the wire bolt lock. He doubts the advisability of having distant signals, except where train movements are actually high speed. On his road the signal engineers, in making a general inspection, disconnect tight back wires so as to test the adjustment of both wires. As an additional safeguard against difficulty with wires not well adjusted, shields have been put on signal arms so that the light indicating "proceed" is hidden until the arm is at least half way down to the go-ahead position. Mr. Rhea believes that if a pipe connection can be afforded to only one signal it should be used with the distant rather than with the home, as the distant is the more important signal of the two.

Mr. Elliott has both wires taut, using a tripping device to release the front wire if the back wire breaks. His success with wires is such that he thinks pipe connections unnecessary.

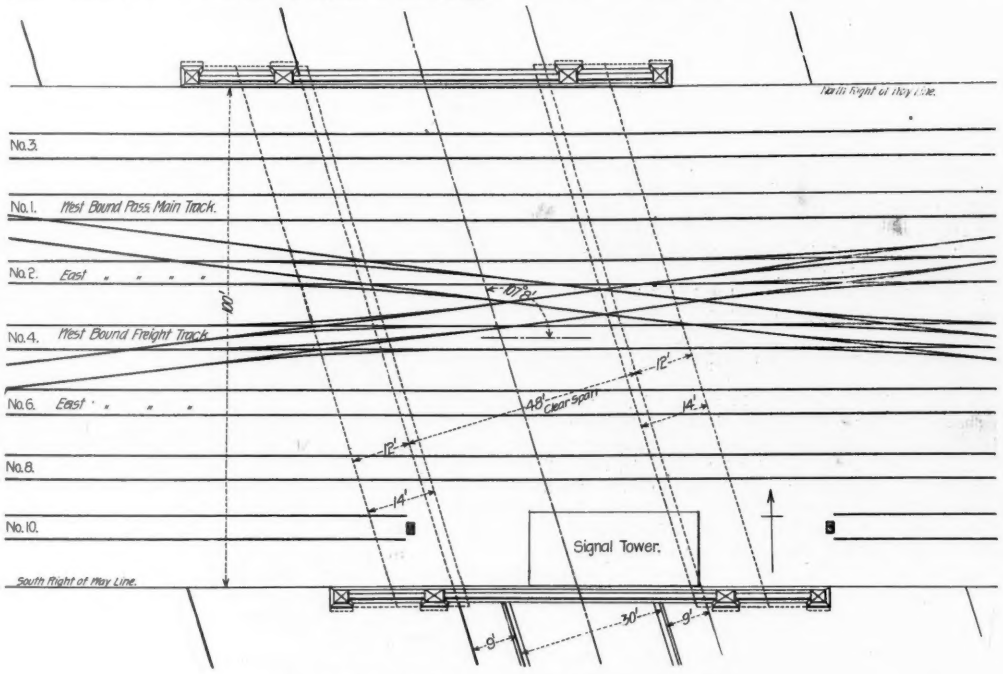
Mr. Cade (Standard Railroad Signal Co.) thought that for distances greater than 3,500 ft. mechanical connections to distant signals should be abandoned and an electric motor used to work the signal. To use a drum and a ratchet lever to work a distant signal wire, as had been suggested by Mr. Elliott, involved well-known difficulties.

Mr. Rhea, holding that, if a bolt lock is used, the compensator cannot be used, advocated retaining the bolt lock and going without the compensator. By careful construction and inspection he satisfactorily works bolt locks in which the slot in the bar is only 1½ in. long. Asked if the stretching of wires was not troublesome, he replied that the chains always give out before the wires.

At this point a number of members discussed the advisability of using crossing bars (detector bars) at crossings of one road with another. The Lehigh Valley has adopted this practice at all crossings. Mr. Rhea called attention to the fact that crossing bars sometimes cost more than they are worth as safeguards. In the large plant at Hammond, Ind., there are 39 bars. The use of bars has been stimulated by the action of the Illinois State Railroad Commissioners in requiring them at crossings. It appears that the inspector of the Commission can suspend the operation of this law at his discretion, but it seems that he does not often do so.

The foregoing discussion ended the afternoon session. In the evening the first subject taken up was the protection of crossings, and a paper by Mr. C. S. Rhoads (C., C., C. & St. L.) was read. Mr. Rhoads discussed the proper distance from the crossing at which derails should be placed. Since crossings were first interlocked in this country the average speed of trains has been greatly increased. In view of this—

"Are we not ignoring the factor of safety to a certain extent in the effort to make fast time? If so, we should sound the alarm. If we are not even up to the requirements of to-day, what of to-morrow? Should we not urge that derails be located much farther from the fouling points, especially at grade crossings, and in addition thereto the use of some device that will prevent the possibility or at least the probability of derailment of our fast trains? A brakeman attending a switch for a train on a siding, which is waiting for a train to pass, must stand not less than 10 ft. from the switch while the expected train is passing. This to prevent the possibility of the switch being thrown under the train. Yet we place a towerman where his hand is on the lever, that if wrongly thrown means great destruction and probably loss of human life. Instead of admitting that we need additional safety in case of a derailment, we content ourselves by punishing the person apparently at fault and rest content, instead of demanding something that would prevent a recurrence. The Illinois Railroad and Warehouse Commission require trains to proceed under control over crossings. It has authorized the location of derails 400 ft. from the crossing, the rule having recently been changed to 400 instead of 300 ft."



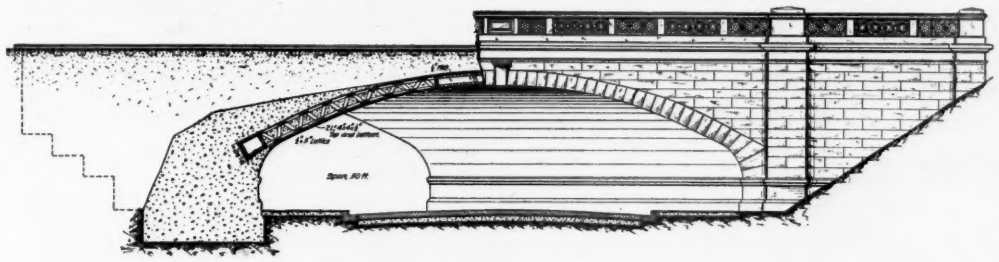
Plan of Tracks - Melan Railroad Bridge, Detroit, Mich.

Mr. Rhea—If we move the derailing switch back too far from the crossing we infringe the rights of the transverse road; for, by holding our trains back too far, we keep the crossing locked against the other company too long, especially in the case of slow trains. Three hundred feet is far enough away, and the distant signal should not be over 1,800 ft. in the rear of the home.

Mr. Rosenberg (L. V.)—There is a disposition on our road to put derailers farther away, and in one

instance, where the transverse road approaches on a descending grade, the distance has been increased from 300 ft. to 600 ft.

Mr. Cade—Are we not giving too much attention to the use of derailers and detector bars at crossings of one road with another, many of them at points where the traffic is very light, while we neglect junctions at which the traffic is heavy? Every junction



Elevation and Section—Melan Railroad Arch.

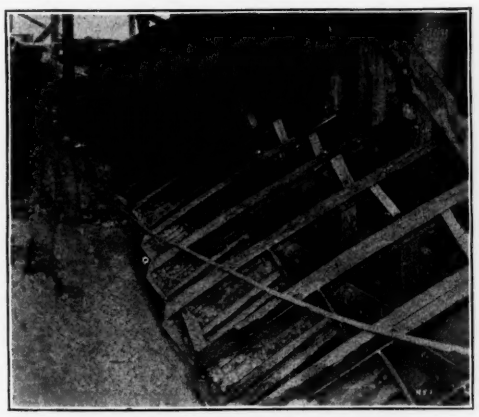
is practically a grade crossing; and if we are to protect the most dangerous points first, many junctions ought to be attended to, while some crossings which have been equipped might have waited. Why should a road be at such great expense at one place, simply because another company is interested, while neglecting more dangerous points on its own lines? . . . With a derailer there should always be a guard rail to keep the derailed train in line with the track and close to it. It has been said that this is dangerous, because it makes it more likely that a derailed train will strike some train on the transverse road. But this argument has little weight because the likelihood of striking a passenger train is very remote. With good discipline a derailer is of questionable value, and the view is gaining ground that it is not an essential factor in the protection of trains at crossings. In response to this remark a member advocated the use of the derailer as a powerful moral safeguard, the engineman's fear of an investigation impelling him to stop before it is too late; but Mr. Cade replied that one of the best moral safeguards which he knew of was to more thoroughly discipline the engineman. One good way which he recalled in English practice was to suspend a man three months if the signalman reported him as running past a stop signal; suspend only one month if the engineman promptly reports himself, and suspend the signalman two months if he fails to promptly report the engineman.

On the Philadelphia & Reading derailing switches are 300 to 400 ft. from the fouling point. On the Chicago, Milwaukee & St. Paul the distance is 400, with a guard rail 120 ft. long. Mr. Elliott believes that it would be well to make the distance 500 ft. The Michigan Central is going to put some in at that distance, and the Lehigh Valley will do the same.

The paper on Automatic Block Signals, by Mr. Short, was next read. This was given in the Railroad Gazette of February 24.

Mr. Keppell (P. R.R.)—If you shorten your repairmen's sections and have all the inspection and work on a single section done by one man, how are you going to train your apprentices? It seems necessary to have sections of such length that each repair-man can have an assistant, who will gradually fit himself to fill the place of his superior.

Mr. Short, replying to questions, said that the re-



Abutment and Steel Ribs—Melan Arch.

lays of automatic signals should be inspected daily, and at all events the inspectors should be so assigned that prompt inspection can be made; for, after an electric storm, this may be an important necessity.

Mr. Keppell—I would not allow inspectors to meddle with relays. I would seal up each instrument, and in case of the failure of one to work would have the inspector take it out and put in another, keeping on hand sufficient extra relays to do this. I would rather burn out a few relays than have fuses with numerous failures on account of their delicacy.

Mr. Wilson (Hall Singal Co.)—If an inspector finds an automatic signal out of order he should put it to the stop position and leave it there. . . . In the case of a facing point switch, the signal circuit should go through the switch instrument, even if a mile or two of line wire additional is needed, for the shunt is not a sufficiently sure reliance on which to depend for putting the signal to stop when a switch is set for the side track. If the shunt wire should be broken and the break not be discovered the switch could be moved and the signal remain at "all-clear."

Mr. Keppell—I have had shunt wires broken, but no trouble resulted, as the switch point, not being cut out, shunted the circuit so as to throw the signal to the stop position. Probably 90 per cent. of our failures at switches are due to metal obstructions between the rails. We have no trouble with leakage at plank road crossings.

At this point there was a desultory discussion of the question whether an automatic signal should or should not turn from the clear to the stop position just before the engine passes it. Mr. Wilson pointed out that with the high speeds now common it is necessary, in order to have the engineman see a signal move, to place the post nearly or quite 400 ft. in advance of the beginning of the rail circuit. Now, in a dense fog, an engineman cannot see this distance ahead, and therefore he is likely to find signal after signal in the stop position, and in each case be unable to decide whether it was placed in that position by his own engine or by a preceding train which may still be in the block.

Mr. Short, replying to questions, said that he had made a number of experiments with signal lamps designed to burn a fixed number of hours so as to obviate the necessity of going to each signal in the morning to extinguish the light. He aims to limit the life of the flame by making an oil reservoir just large enough to hold the necessary quantity of oil for one night. He finds, however, that different burners vary greatly in the amount of oil consumed, and that a number of apparently trifling circumstances, such as the adjustment of the wick or the quality of it, or the draft, may produce a decided change in the number of hours that the lamps will burn.

The officers of the club elected for the ensuing year are: President, A. M. Keppell, Jr. (P. R.R.), Pittsburgh, Pa.; Vice-President, John Cargill (C. & N. W.), Chicago, Ill.; Secretary and Treasurer, C. O. Tilton (C., M. & St. P.), West Milwaukee, Wis.; Member of the Executive Committee, W. H. Elliott (C., M. & St. P.), Chicago.

On Wednesday forenoon the members of the club inspected the signaling at the Broad St. terminal station of the Pennsylvania Railroad, and also on the approaches. The party was shown around by Mr. J. E. Gillmor, Supervisor of Signals of the Delaware Extension & Kensington Division.

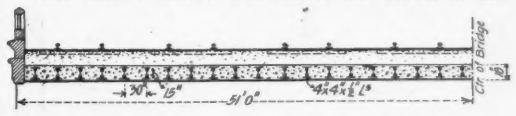
A Melan Concrete-Steel Railroad Bridge.

The Melan arch bridge under the Michigan Central Railroad tracks, at the Southern Boulevard, in Detroit, Mich., was designed in 1895 by Mr. Edwin Thacher, Mem. Am. Soc. C. E., and was built in the autumn of 1895 and the spring of 1896. The face of the spandrel walls and arch ring is finished in ashlar masonry, but the body of the arch ring is built according to the Melan concrete-steel system, the chief feature of which is the use of stiff steel ribs embedded in the concrete of the arch ring.

The arch is on a skew, the angle between the centre line of tracks and the axis of the arch being 72 deg. 52 min. The bridge is 100 ft. wide in the clear between railings, at 90 deg. to the line of tracks, and the span is 48 ft in the clear at 90 deg. to the face of abutments, or 50 ft. and 3 in. measured on the line of track. The bridge carries six tracks and a large signal tower, but is wide enough to accommodate eight tracks.

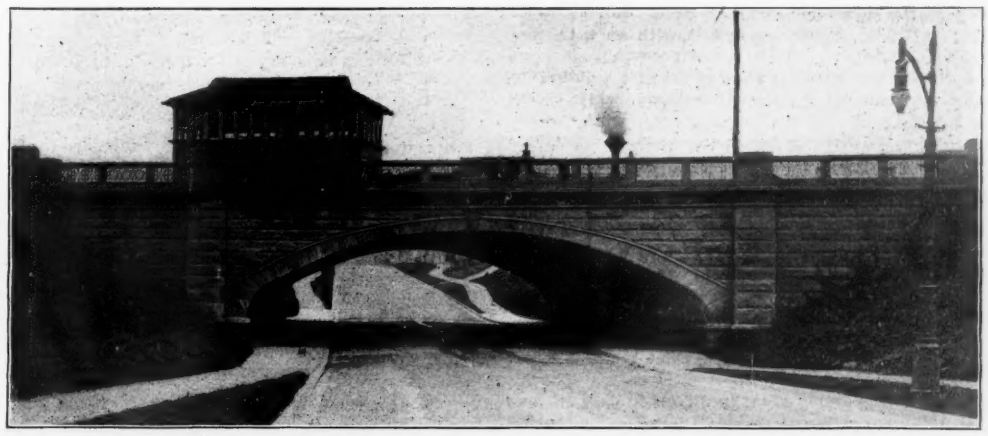
The intrados is a curve of three centers with a rise of 9.5 ft., giving 13 ft. headroom over the Boulevard at the crown. The arch ring is 18 in. thick at the crown, increasing to about 90 in. at the springing. It was built of Portland cement concrete, mixed one part of cement to two of sand and four of broken stone, and contains, embedded in the concrete, 41 steel ribs spaced 30 in. centre to centre. These ribs are built up of four angles 4 in. by 4 in. by ½ in., with a solid web 12 ft. long at the centre, and laced with 5 in. by ½ in. bars between the centre web plate and the end. They are 15 in. deep at the crown and 24 in. deep at the springing.

The base of rail is 2 ft. above the crown of the



Half Cross Section—Melan Arch.

arch. This is at least a foot less fill than it is desirable to have; but in this case, with only 16.5 ft. between the grades of Boulevard and of the railroad (and even this was only obtained by depressing the roadway), it was desirable to reduce the thickness to the lowest limit practicable. Largely on this account the arch ring was designed much heavier than is ordinarily required, even for railroad bridges, because the close proximity of the rails to the crown of the arch prevented the usual amount of distribution and cushion from being secured.



A Melan Concrete-Steel Railroad Bridge at Detroit.

The bridge was built under patents owned by the Melan Arch Construction Company, New York.

Mornington Tramway, New Zealand.

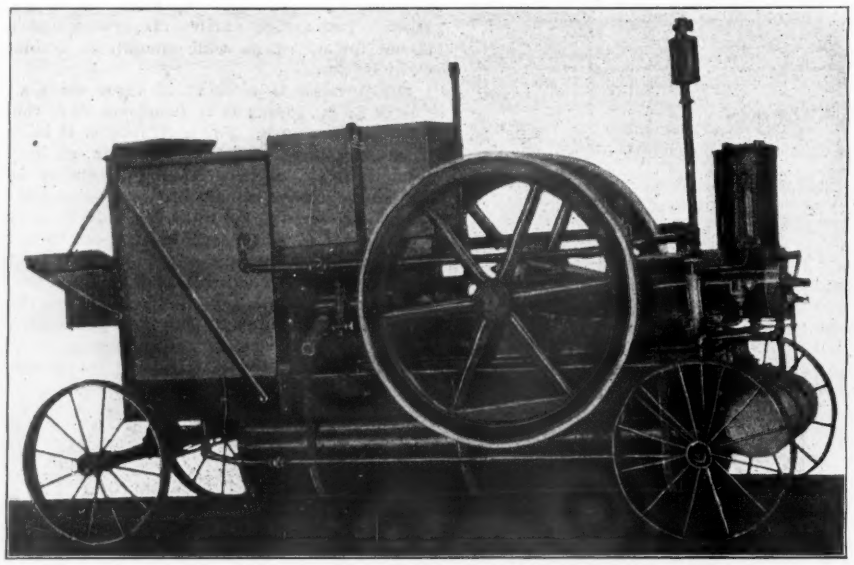
The line of the Mornington Tramway Company, Limited, extends from Dunedin to Mornington, N. Z., with an extension a half mile long, the maximum grade of which is 1 in 3½. The entire line is worked by cable, the main line being double track, with a rise of 450 ft. to the mile, by varying grades from one in six, to level, on flats of about 200 yds. The power station is equipped with three high-pressure horizontal engines with 13 in. by 27 in. cylinders, two being used to drive the main line cable, and one the extension line cable. Each engine is fitted with an automatic extension gear capable of allowing the engines to work up to a maximum of 71 h. p. The equipment consists of six grip and four trailer cars, and one combination car, which is used for freight and coal, and, in busy times, as an open car for carrying passengers, which car, we are informed, is highly appreciated in fine weather. The grip cars are fitted with two wooden slipper, or track brakes, and four cast iron brake shoes for the wheels; and the axles of the grip and trailer cars are fitted with ratchet wheels and pawls, which are used for stopping when climbing an incline.

Mr. Joseph Lowden, Engineer of the Mornington Tramway Company, Limited, to whom we are indebted for the above information, has sent us a list of electrical materials, and specifications for an upright engine, which he thinks of buying in America.

Mr. D. R. Eunson, General Manager of the road, is also Manager of the Dunedin City & Suburban Tramway Company, which is worked with horses, but the motive power will be changed in the near future, probably, to electricity.

A Portable Air Compressor.

The accompanying engraving shows a portable air compressor and a gasoline engine as lately built by Fairbanks, Morse & Co. for the Cleveland Ship Building Co. Pneumatic tools are now used to a large extent in shipyards, and where there are several slips, portable compressors, which can be moved from one point to another as required, are considered to be more suitable for this class of work than a single large stationary compressor plant with an extensive system of piping. Several similar combinations of compressors and gasoline engines are also building by the same company for use in the field, while erecting bridges and other structural steel work, where the riveting is done by pneumatic tools.



Portable Air Compressor of the Cleveland Ship Building Company.

In the special combination illustrated a 12 h.p. gasoline engine and direct-connected compressor are mounted on the same base, the cylinders being placed tandem, while two heavy flywheels are provided which control the length of the stroke and the speed. The engine and compressor differ in no important way from those now largely used in stationary plants. The engine is fitted with a self-starting apparatus, electric igniter and a device for muffling the exhaust. The wagon has a frame made of 10-in. steel channels and steel wheels and axles. The air receiver is a cylinder 28 in. in diameter by 6 ft. long suspended beneath the frame; the gasoline tank is suspended from the rear and two water tanks are mounted on the frame at the front and contain the cooling water for the power and air cylinders respectively. Means are provided for attaching horses where the plant has to be moved through considerable distances.

The Hammer-Blow of Steam in Locomotive Steam Chests.

Observations made last year on a passenger engine of the Chemin de fer du Ouest in France give some interesting information in regard to the conditions prevailing in the steam chest when the engine is working. By means of recording gauges diagrams of the pressure on both sides of the valve, as well as in the dry pipe and boiler, are obtained simultaneously. By comparing these diagrams it was found that on engines with comparatively large throttle valves violent fluctuations in the pressure within the steam chest appeared, which occasionally exceeded the boiler pressure considerably.

These fluctuations are caused by the inertia of the steam volume in the pipes leading to the steam chest. When the valve uncovers the admission port the pressure falls in the steam chest, causing an acceleration of the velocity in the steam pipes; while, when the port again becomes closed and the flow is suddenly checked, a rapid rise takes place, corresponding to the hammer-blow in hydraulics.

These fluctuations may be approximately determined by figures. The decrease in pressure, expressed in atmospheres, is equal to $\frac{p\ v}{g\ t\ s}$ if p is the weight of the steam column, v its maximum velocity, s the area of the steam pipe, t the duration of the flow or the time during which the port remains open, and g the acceleration due to gravity. For ascertaining the force of the concussion the momentum of the steam column, $\frac{m\ v^2}{2} = \frac{p\ v^2}{2g}$, is equal to the work of compression in the steam chest. With a cut-off of 0.3 of the stroke and a speed of 80 km. (50 miles) per hour, the fall in pressure is thus found to be 0.75 below and the rise 0.93 atmosphere above the prevailing boiler pressure (11 and 13.7 lbs. respectively), which figures closely correspond to the observations made with the recording gauges.

It was further shown that the fluctuations were not materially altered by partially closing the throttle, except that a very slight throttling had the effect of decreasing the steam concussion without reducing the mean pressure in the steam chest, thus producing a more constant flow of the steam, and consequently reducing the tendency to lift water. (Revue générale des chemins de fer.)

New Express Locomotive for the English Great Northern Railway.

By J. Pearson Pattinson.

Since the lamented death of the well-known Mechanical Engineer of the Great Northern Railway of England, Mr. Patrick Stirling, his successor, Mr. Ivatt, has been experimenting with various types of four-coupled locomotives, designed to haul the fast express trains of this company, which have, of late, mainly owing to the introduction of dining cars and long 12-wheeled corridor vehicles for both the first and third class, greatly increased in weight. The latest type turned out from the Doncaster shops is, for England, quite a monster locomotive, weighing no less than 58 tons (English), of which 31 tons is available for adhesion. The engine, numbered 990, is a 10-wheeler, and has its four-coupled wheels under the boiler and a small pair of carrying wheels under the firebox. The principal dimensions are:

Cylinders (outside)	19 in. x 24 in
Coupled wheels	6 ft. 9 in
Bogie and trailing wheels	3 ft. 6 in
Length of boiler	14 ft. 8 in
Diameter of boiler	4 ft. 8 in.
Heating surface, tubes	1,362 sq. ft
" " firebox	140 sq. ft.
Grate area	26¾ sq. ft.
Boiler pressure	175 lbs. per sq. in.

By the kindness of the Great Northern management an opportunity was afforded the writer of making a trip behind this fine engine in daily service. No previous warning was given that the results of the running were about to be noted, so that the figures in the subjoined table may be taken to represent everyday work. The outcome was entirely satisfactory, the locomotive, in spite of three casual slackenings and one service reduction of speed, easily improving on the schedule time, and this although a strong side gale of wind blew throughout the entire journey. Some notes on the uphill speeds will be found below, and of the speeds on down grades it may be said that they were never excessive, and, in fact, were rarely above 70 miles an hour.

The log of the running is subjoined:

London to Grantham, 105⅓ Miles in 120⅘ Minutes (G. N. R. Engine 990).

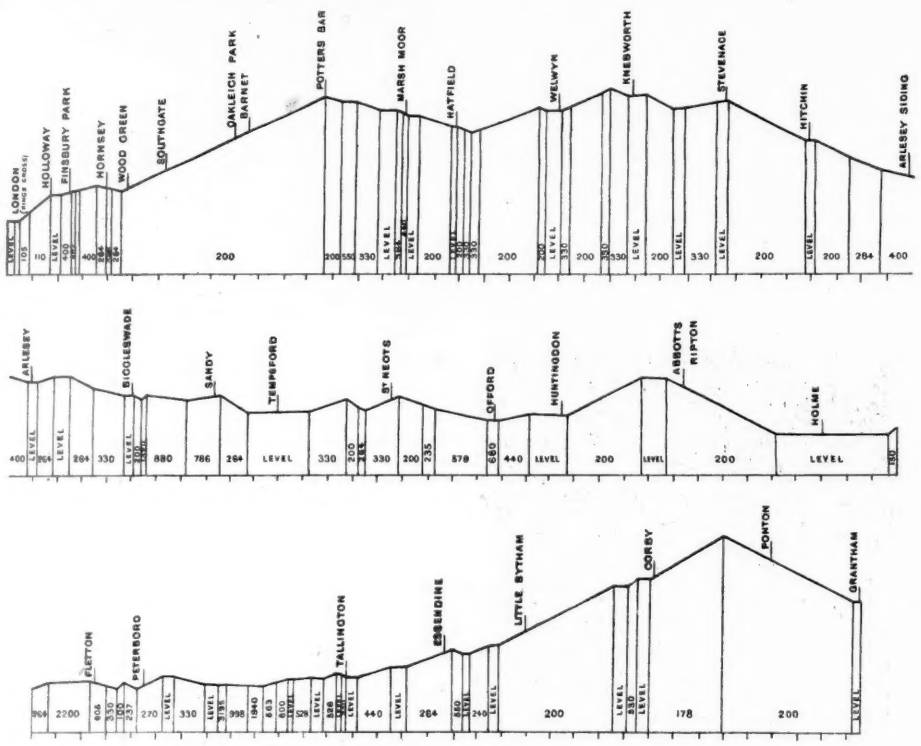
Down Leeds Express, Jan. 21, 1899.

Load: Six eight-wheel coaches, 2 twelve wheel coaches, 185 tons (English). Strong side wind throughout the journey.

Distance. Miles.	Chains.	Stations.	Actual Time. H.	M.	S.	Notes and Remarks.
		King's Cross	9	47	9	
1	50	Holloway	9	50	25	
2	42	Finsbury Park	9	51	59	
3	33	Harringay	9	53	14	
4	4	Hornsey	9	54	1	
5	0	Wood Green	9	55	1	
6	30	New Southgate	9	56	42	
8	33	Oakley Park	9	59	3	
9	17	Barnet	10	0	2	
10	47	Hadley Wood	10	1	52	
12	58	Potter's Bar	10	4	40	Relaying, slack after Potter's Bar.
17	57	Hatfield	10	10	30	
21	79	Welwyn	10	14	13	
25	3	Knebworth	10	17	44	
28	46	Stevenage	10	21	21	
31	76	Hitchin	10	24	48	
—	—	Three counties	10	28	29	Bad relaying, slack.
37	2	Arlesey	10	30	6	
41	6	Biggleswade	10	35	34	
44	5	Sandy	10	38	41	
47	37	Tempsford	10	42	13	
51	50	St. Neots	10	46	43	
55	71	Offord	10	50	52	
58	65	Huntingdon	10	53	29	
63	28	Abbott's Ripton	10	58	41	
69	22	Holme	11	4	2	
—	—	Yaxley	11	7	13	
76	20	Peterborough	11	11	33	Very slowly through Peterborough.
84	60	Tallington	11	22	23	
88	44	Essendine	11	26	38	
93	11	Little Bytham	11	31	8	
97	0	Corby	11	36	58	Strong gale of wind here.
101	76	Great Ponton	11	44	1	
105	26	Grantham	11	47	49	
						Badly checked by signals outside Grantham.

Reference to the gradient profile shows that the principal rising gradients are encountered between Wood Green and Potter's Bar, where there is an ascent of 8 miles at 1 in 200, and between Little Bytham and the summit near Great Pondon, where the locomotive has to negotiate 9 miles, starting at 1 in 200 and finishing at 1 in 178. The first of these two ascents was managed very well, in spite of the strong side wind, the speed at the foot of the bank being about 55 miles an hour, decreasing gradually until, at the top, the creditable rate of 47 m. p. h. was being maintained. On the other ascent, slightly better work was done on the portion rising at 1 in 200, but toward the top on the stretch of 1 in 178, the speed fell to 44 miles an hour, this being partly due to the side wind, which was then blowing with great force.

The photograph which illustrates this article is by F. Moore of London, and the gradient profiles are reductions from the official drawings.



Profile of the Great Northern Railway—London to Grantham.

NOTE.—*The divisions on base line are miles. The numbers express grades; Thus,* 200 *means a grade of* 1 *in* 200.

The New East River Bridge.

In our last issue, page 143, we announced that the New Jersey Steel & Iron Co. had been awarded the contract for the towers and approach spans of the New East River Bridge, the contract price being $2,220,230.

The first contract executed was for the New York foundations, and was signed on Oct. 23, 1896. Since then the work has been pushed along as fast as the appropriations warranted, until now the two piers forming the foundations of the Brooklyn tower are practically finished, and the Brooklyn anchorage is about half done, everything below the ground level having been completed. On the New York side the piers for the foundations will soon be finished, and the masonry work for the anchorage has just been started. Mr. Buck's report of the work done up to the close of 1897 may be found in the Railroad Gazette, Jan. 7, 1898.

In the following table is given a summary of the weights of the metal to be used in the new work, the contract for which was let last week:

Weights of Metal for Towers and Approach Spans for New East River Bridge. One Side of River.

	Plates.	Angles.	Beams, Channels, Pins and Bolts.	Castings.	Totals.
End span.					
Cantilever span, one ..	822,080	481,260	3,560	24,000	1,330,900
Connecting span, one...	369,340	259,750	.....	.....	629,090
Top lateral system	35,250	61,650	.....	.....	96,900
Bottom lateral system	39,820	126,600	.....	.....	166,420
Overhead trusses, etc..	350,370	246,030	.....	.....	596,400
Floor beam hangers	13,470	93,150	.....	.....	106,620
Floor system..	938,400	1,033,800	363,200	.....	2,335,400
	2,568,730	2,302,240	366,760	24,000	5,261,730
Rivet heads...	.....	.....	.....	.....	201,270
					5,463,000
Intermediate tower—					
Columns	120,910	45,950	200	.....	167,060
Long. bracing.	36,680	41,900	.....	.....	78,580
Trans. bracing	46,260	54,240	.....	.....	100,500
Trans. bracing, center..	17,630	22,470	610	.....	40,710
9-in. girders..	15,940	8,360	.....	.....	24,300
18-in. girders.	78,150	20,070	.....	.....	98,220
Cov. plates...	4,770	.....	.....	.....	4,770
Diaphragms...	5,080	5,680	.....	.....	10,760
Bearings	10,010	.....	18,820	.....	28,830
Pins	.....	.....	1,290	.....	1,290
Column bases, etc.	.....	.....	.....	79,900	79,900
Foundation ..	.....	.....	9,800	600	10,400
	335,430	198,670	30,720	80,500	645,320
Rivet heads..	.....	.....	.....	.....	20,980
					666,300
Main tower—					
Saddles, etc...	95,560	.....	209,980	582,260	887,800
Girders at top	340,230	179,650	.....	.....	519,880
Trusses and girders	172,600	83,430	70	1,380	257,480
Main cols.....2,246,800		425,550	.....	.....	2,672,440
Bracing	761,500	756,000	.....	.....	1,517,500
	3,616,780	1,444,630	210,050	583,640	5,855,100
Rivet heads...	.....	.....	.....	.....	241,000
					6,096,100
Totals (one side river)..	6,520,940	3,945,540	607,530	688,140	11,762,150
Rivet heads...	.....	.....	.....	.....	463,250
					12,225,400

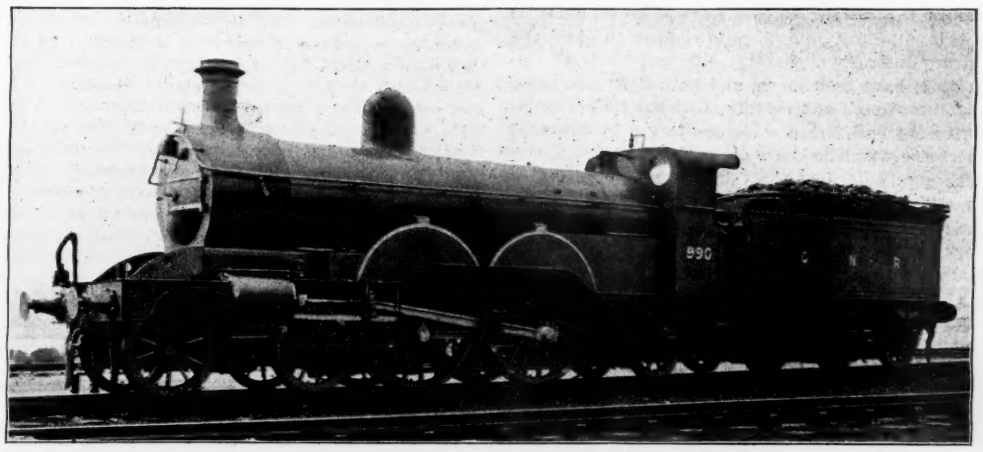
"Ordinary" Sleeping Cars.

The introduction of a new class of sleeping cars on the Baltimore & Ohio was noticed in the Railroad Gazette last week and the week before. The reduction of the rates for berths has attracted considerable attention and the accompanying engravings showing the interior of the cars will be found of interest. Forty cars are now building at the works of the Pullman Co., Chicago.

From the plan, Fig. 1, it will be seen that the arrangement is in general similar to that which is common to the "standard" Pullman and the well-known tourist sleeping cars. There are 32 double berths. At one end of the car is the women's toilet room, opposite which is the heater, with a warming oven above. At the other end of the car is the men's washstand, not partitioned off from the aisle. There are no smoking or other compartments, so that the car is but 61 ft. long over end sills.

The outer appearance is similar to that of other Pullman cars. The car has wide vestibules and four-wheel trucks. The ordinary sleepers have numbers instead of names. The interior of one of the new cars now running on the Baltimore & Ohio is shown in Fig. 2, and that of a standard sleeper in Fig. 3, the two engravings affording a fair comparison of the two designs. The ordinary sleeper is finished in birch, stained a light mahogany, is without ornamentation and has a square deck roof. Instead of heavy upholstery the seats are of rattan, and generally only the aisles are carpeted. Pintsch gas is used for lighting.

On the Baltimore & Ohio passengers holding second-class railroad tickets can use the ordinary sleepers.



Express Locomotive, Great Northern Railway—England.

Fig. 3.—Standard Pullman Sleeping Car.

Fig. 2.—"Ordinary" Pullman Sleeping Car.

Electricity on the Long Island Railroad.

Plans have been completed and some contracts have been let for running electric cars over the tracks of the Long Island Railroad between Far Rockaway and Rockaway Park, a distance of about seven miles. The portion of the road between these places, which now has but a single track, will be double tracked and an overhead wire will be strung the entire length of the two tracks from Far Rockaway to Rockaway Park. The electric cars will probably run on a 10-minute schedule between the regular steam cars. Power will be obtained from the local generating plant at Far Rockaway. The plan also provides for extension of electric tracks on the streets of Far Rockaway, connecting with the electrified tracks of the Long Island. The purpose of this equipment will be to provide better transit facilities between resorts on the beach, and has nothing to do with through service of the road.

The consulting engineers of the road, Messrs. Jacobs & Davies, and Walter H. Knight, will have general supervision of the work. It is proposed to complete the equipment as soon as possible, in order to take care of the heavy summer traffic.

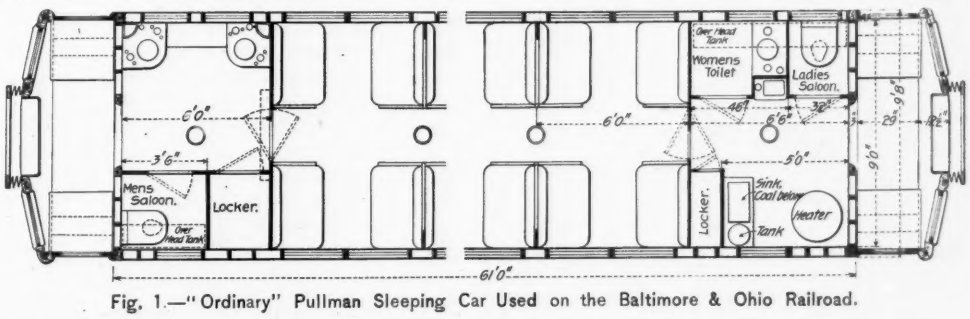


Fig. 1.—"Ordinary" Pullman Sleeping Car Used on the Baltimore & Ohio Railroad.

Foreign Railroad Notes.

The French State Railroads seem to have a great number of trains in proportion to their traffic. With an average of 232 passengers and 246 tons of freight each way daily there are 7.4 trains, and an average train load of 31 passengers and 34 tons of freight. With such loads, it is not surprising that 72½ per cent. of the earnings are absorbed by the expenses.

France has provided its colony, Algiers, which has been some 60 years in its possession, with a considerable system of railroads, 1,818 miles in all, besides 332 in the adjacent province of Tunis. They have developed but a very moderate traffic, and their average earnings per mile in 1897 were but $2,480 in Algiers and $1,596 in Tunis. More than one-third of all the earnings in Algiers are on a little system of 319 miles, owned by the Paris, Lyons & Mediterranean Company ($5,028 per mile).

It has been decided to work trains through the Giovi Tunnel, near Genoa, by electricity. It was in this tunnel where a serious accident resulted a few months ago from asphyxiation of the engineer and fireman of a train. Since that time a long interval between trains has been preserved, so that the gases produced by one might be largely dissipated before another entered. The electrical plant is to be equal to passing 2,500 freight cars daily.

The French are credited with the intention of building a railroad some 330 miles long from the West African coast, just north of Sierra Leone, northeastward to navigable water on the Niger, and this chiefly because the English are building a line from Freetown, in Sierra Leone, into the interior. It would hardly seem to be time yet to build competing railroads in Africa.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

The Railway Signaling Club, whose meeting is reported in another column, appears to have taken a new lease of life. The semi-comatose condition which has afflicted it during the past year has not been due to any want of zeal among the members, and at Philadelphia a half dozen members promised to prepare papers in the near future. This is a sign of life which would be warmly welcomed by some societies much older and larger than this. The longest paper read at the Philadelphia meeting, that of Mr. Wileman, which we reprint to-day, is an example of the good work that this club can do. Mr. Wileman will pass for a good romancer, for his statement of his imaginary distant-signal problem was so worded that most of his hearers thought that he was describing an actual installation; but there was plenty of hard fact in his argument, and the subject is in many respects the most important single topic in the railroad signaling field. To save the time of trains is a chief element in the demand for fixed signals, and yet, by the omission to provide distant signals, this very element is in many cases neglected. The greatest need of the Signaling Club at present is to have a few superintendents in the meetings. The discussions show that as signal engineers the members are thoroughly alive to their duties and to the importance of their offices; but it is also apparent that the members do not always accurately estimate their relations to the other departments. Signal engineers often fail to adjust themselves to the superintendent, in two opposite ways; first, they are too generous with him; they undertake by the arts of signaling to meet demands which he ought himself to meet from other resources which are available; second, they are too modest; they do not put forth sufficient energy in pressing their own needs on the attention of the superintendent. As, generally, he has a better "pull" with the treasurer than the signal department has, the signal engineer is bound to impart to him all his own enthusiasm for progress—if he can. The modesty of the signal men is, indeed, the reason, no doubt, why they have not already invited the superintendents to join in their discussions.

Yellow Signal Lights.

The discussion of signal light colors by the Massachusetts Railroad Commissioners, in their annual report, which was noticed in the Railroad Gazette last week, is a good though brief summary of the past few years' discussions of this matter among railroad men; and, therefore, we reprint the chapter in another column of this issue. The Commissioners' interest in the subject now is due to the collision of Sept. 9, last, at Whittenton Junction, on the New York, New Haven & Hartford, with which our readers are already familiar; and, as heretofore announced in the Railroad Gazette, it has been decided by the management of that road that the fixed signals on the several divisions of the Eastern District shall be changed so that at night the indication for all clear shall be a green light. The arms of the distant signals have a green glass to indicate all-clear, and a yellow glass to give the contrary indication. Several different kinds of yellow glass have been made, and both light and dark, as well as rough and smooth, will be tried in order to give the enginemen a chance to see by extended experience which is the most satisfactory.

The significance of the Commissioners' action at this time lies in the fact that we thus have an official (and entirely conservative) recognition of the dangers connected with the use of "white" or ordinary lights for the all-clear indication. The Commissioners did not attempt to decide what to do about getting a third color, but evidently they expected the railroad company to take up this matter and stick to it until some useful conclusion could be reached. And the significance of the action of the railroad company is in the fact that it did grapple with this third-color problem, which thus far has scared everybody off. Green for all-clear has long been in use on the Chicago & Northwestern and elsewhere; but the C. & N. W. uses a combination of a red and a green light on the distant signal. This evidently has not found favor with the New Haven people.

It seems to us that there is every reason to expect that the yellow lights will prove a success. Green for all-clear is already a success. With enginemen and firemen free from color blindness, and with a full equipment of distant signals, the use of green and red in home signals presents no new problems. There can be no question that yellow is the best single color, after red and green. The New Haven people have made many experiments, and from what General Superintendent Clark tells us of these, we judge that the supposed difficulties have been met, with little delay, as fast as they were taken up and considered; and we see no reason to change our views in favor of yellow expressed four years ago (Nov. 9, 1894) and repeated occasionally since then. The only problem which is not fully settled (or which cannot be, by well-known means) is that indicated by the Massachusetts Commissioners, where they speak of the objections to yellow of too dark or too light a tint. If too dark the light may appear red, indicating "stop;" if too light it may appear white, which will also indicate "stop." This settled, the whole thing is settled.

But is not this an exceedingly simple matter? At the worst the engineman is merely going to lose time. If he sees a red light he sees nothing different from what the English engineman sees at every distant signal that he finds "on" in a night run. The Englishman has no trouble with the red because he has no difficulty in always deciding by the location of the post whether it is a home or a distant that is under his eye. Only ordinary common sense is required for this, and the fastest trains lose no time.

If our New Haven runner sees white, he only gets an indication to bring his speed under control as soon as possible (so as to see what is the matter with the lamp); and that is not appreciably different from what he would understand by the light if he saw it correctly. If the light has gone out and he fixes his eye on a street light or some other foreign light, in place of the signal, he is immeasurably better off than under present practice, for the strange light becomes a cautionary signal instead of one to lure the runner on beyond where the signal would permit him to go.

Finally, why should there be any trouble from foreign lights at all? A distant signal should be 1,500 ft. or more from the danger point. At this distance the speed can be fast enough for all practical purposes, and yet slow enough to permit the engineman to read the distant signal at short range; so short that foreign lights need cause him no trouble, however cautious he may be. Again, a distant signal is nearly always remote from other signals, and its location is not prescribed by conditions which cannot be changed. It can be moved forward or backward several hundred feet, if necessary. The light can be as low as 10 ft. from the ground, or even lower, or it can be as high as 40 ft. In England they have signals higher than this, adding a low arm (and light) for use whenever fog obscures the high one. With these variations at command, and with perhaps a board screen in rare cases, foreign lights can be banished in probably 99 per cent. of the cases on any road. The hundredth case may need a second locating light, or may necessitate placing the distant signal so far from the home that an intermediate distant will be found desirable.

The Intercontinental Railroad.*

The report of the doings of the Intercontinental Railway Commission has been printed by the Government in four volumes and three cases of maps and profiles, being altogether a handsome and convenient publication. The first volume is a condensed report, being a general round up of the work of the Commission itself and of the various corps of engineers which it sent out. The plan evidently was to prepare in this volume a general summary of the work which should be sufficient for the use of most readers. The other three volumes and the maps and profiles which accompany them give in detail the report of the first, second and third corps of engineers and the detailed results of their operations in the way of accumulating information. These volumes, therefore, are of special interest to the engineer and technical railroad man.

The first meeting of this Commission was held in Washington Dec. 4, 1890, the Commission itself being the outgrowth of the International American Conference. At this first meeting the Commission was organized by electing Mr. A. J. Cassatt as President. Early in its history Capt. E. Z. Steever, 3d Cavalry, U. S. A., was elected Secretary of the Commission, and Lieut. R. N. G. Brown, U. S. N., was appointed Executive and Disbursing Officer. One of the members of the Commission who served faithfully all through was Mr. L. L. Buck, who represented Ecquador and Peru. The Commissioners served without pay, and, in fact, paid their own hotel and traveling expenses.

The principal object of the life of the Commission was to ascertain whether a practical line of railroad could be built at a reasonable outlay to connect the railroads of the United States and Mexico with those of the southern part of South America. In this enterprise the Commission expended $288,586, of which the United States contributed $195,000 in cash and $50,000 in printing. Brazil contributed $30,000, Columbia $4,000, Guatemala $3,600, Ecquador $3,000, Costa Rica $2,000, Chile $3,000 and Bolivia $2,000.

Corps No. 1 was composed almost entirely of officers of the United States Army and went out under the command of Lieut. Macomb to make the surveys through Central America, and so on into Columbia, to meet Corps No. 2, which should come northward. Corps No. 2, under the direction of Mr. William F. Shunk, was directed to proceed to Quito and survey northward to meet No. 1. Corps No. 3, under Mr. J. Imbrie Miller, was to proceed to Quito and survey southward. These were the only corps ever sent into the field. No. 4 was to have gone to Chile and Nos. 5 and 6 to Bolivia, but there was not money enough to send out these corps.

A general plan of route and operation was laid down by the Commission, but the chiefs of corps were left with full authority to vary from the line. They were instructed to make their surveys detailed enough for the preparation of a topographical map and for the location thereon of the lines selected and for making profiles of the lines.

Mr. Miller's health failed and he returned from the field early, and was succeeded by Mr. William D. Kelly. Capt. Steever was never able to go into the field, and he was succeeded by Lieut. M. M. Macomb, 4th Artillery, U. S. A., just before the party sailed.

All three corps sailed from the United States in April, 1891. The first returned in July, 1893; the second returned in June, 1893, and the third corps returned in August, 1892. The first corps had surveyed routes which aggregated over 2,600 miles; the second corps had covered over 2,000 miles and the third corps 1,700.

The character of the work done by these various corps varied considerably in nature and value, and that of the first corps was undoubtedly much the most accurate and complete. This was the only corps equipped with instruments for field astronomy, which is a surprising fact. One would suppose that one of the first men to be secured for the field work of such an expedition would be one proficient in the use of the sextant, and that a sextant would be the most indispensable instrument to be supplied to such a party. Corps No. 1 used both sextant and transit in observations on the sun and stars, getting latitude, longitude and azimuth, and thus checking up the lines run. This corps also laid out and carried through a considerable scheme of rough triangulation, using a transit with four-inch horizontal limb, which in competent hands and seconded by the sextant would give valuable points of control, particularly if frequent azimuths were taken. This corps also appears to have carried mercurial barometers, as well as aneroids, and thus was probably able to get more accurate altitude observations than the other corps. The altitudes in the work of all the corps were determined by the use of the stadia as well as by barometer observations. Unfortunately, as we look at it, the first corps was not able to carry through to the end the system of triangulation which

*The Intercontinental Railway Commission. A Report of Surveys and Explorations and of the Transactions of the Commission, Washington, 1898.

its chief had laid out because the Commission thought that this system would take too much money and too much time.

In the work of all of the corps the main line of the survey was a transit and stadia line. We are told, however, that the chief of the second corps in passing through the dense forests in the eastern part of Costa Rica and in the Isthmus of Panama gave up the stadia and used sound for determining the length and the direction of the course, which, obviously, must have been a very rough method, although doubtless the only one practicable under the conditions. Corps No. 3 also struck some rough and heavily wooded country, where the ordinary stadia method could not be used and improvised a method which was ingenious and might have been fairly accurate. "A mountain top would be cleared and a tall, straight tree selected, stripped of its bark and furnished with a top crossarm, measured and used as a stadia rod, the maximum distance thus read being as great as six miles."

Corps No. 1 ran secondary compass and stadia lines, which were supplemented by odometer, compass and aneroid lines, and these were still further supplemented by paced lines. In brief, in Central America there was a rough triangulation covering most of the country examined, a determination of latitude by sextant, a determination of elevation by triangulation, mercurial barometer and aneroid barometer, a main stadia line and a number of subordinate lines of different degrees of value. In South America the work of the second and third corps was confined almost exclusively to a transit line.

The reports which we now have are of varying degrees of value, as the reader will well understand from what has been said above of the methods. They describe, however, with a good deal of detail the physical geography, the people, the railroads and other means of communication, the towns and the resources of the countries visited, and become altogether a valuable source of information. The reports of each individual corps are printed in Spanish as well as in English, and they are all accompanied by numerous well made topographical maps and by profiles.

The grand summation of the whole matter is that to complete an all-rail route from New York to Buenos Ayres there must be built 5,456.13 miles of railroad, and that this will cost for grading, masonry and bridges $175,000,000. The reader can supply his own figures for rails, water stations, telegraph lines, station buildings, shops and equipment.

We have never taken the Intercontinental Railroad seriously. Its enormous cost is only one of the objections to it. To build a railroad many thousand miles long, which shall not merely be parallel with ocean highways, but actually much longer from port to port than the ocean routes, and to build much of that railroad through a country of great difficulty and of poor and sparse population, has always seemed a fantastic project. The record of these surveys only confirms that notion. The surveys themselves served some useful purpose. They add to the sum of available knowledge and they gave a number of men a chance to display skill, endurance and fortitude; but they confirm the belief that the Intercontinental Railroad is a more chimerical scheme than even Mr. Rhodes' Cape-to-Cairo Railroad.

Massachusetts Commissioners on Signal Lights.

The Massachusetts State Railroad Commissioners, in their annual report, recently issued (Railroad Gazette Feb. 24, p. 137), discuss night fixed signals as follows:

The accident which occurred Sept. 6, 1898, at Whittenton Junction [Railroad Gazette Sept. 30 and Nov. 4] illustrates forcibly the importance of a careful consideration of the matter of colors for night signals on railroads. The accident was a collision, and resulted from the fact that an engineer mistook the white lantern on a highway crossing gate for a safety home signal, whereas the signal was in reality at danger, though the lantern was extinguished. We are informed that since the occurrence of this accident, and in consequence of it, the New York, New Haven & Hartford has adopted the green light as a safety signal at night in place of the white light.

The usual colors for railroad signals, which until recently have been almost universally adopted in all civilized countries, are the following: White, to signify safety; red, to signify danger, and green, to signify caution. These colors were agreed upon at a congress of railway men held in Birmingham in 1841. The choice of these colors resulted originally from the experiments of the brothers Chappe, in France, in connection with the establishment of a signal system devised by them. Among other results of these experiments they stated that the visibility of a red light was but one-third that of a white light of the same intensity, that of a green light one-fifth, and that of a blue light one-seventh. White was chosen as the signal for safety, as being the usual light, as well as the most easily visible; while red, as the most easily visible of the colored signals, was chosen for the most important signal, that of danger. So far as visibility was concerned it would have been desirable for the danger signal to be of the color most easily seen, but it was of course impracticable to use white for a danger signal.

The serious objections to the use of white as a safety signal soon became evident, and have resulted in England in the universal substitution of green as the safety signal at fixed signals, and the abandonment of the cautionary signal [at the home signal post]. Green, however, is still used to signify caution in the case of hand or temporary signals. The permissive block system, so widely used in this country, is not used in England [?], so that a cautionary signal is not there considered necessary, and on English railroads the distant signal is simply a duplication of the home signal.

The objections to white as a safety signal are familiar to all railroad men. They are, first, that if the red lens which forms the danger signal be broken, the light will show safety instead of danger; and, second, that (as in the Whittenton accident) the danger signal may be extinguished, and the engineer may mistake some other white light for the safety signal. The first objection may be, in a measure, and perhaps wholly, obviated by the use of wire glass for the lens; nevertheless, the principle seems sound that the safety signal should be a positive signal.

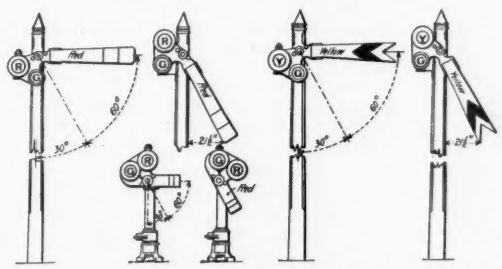
Notwithstanding the abandonment of white as a safety signal in England, the great majority of American railroads still use this color. The principal arguments urged against giving it up seem to be the following: First, that the engineers are accustomed to its use, and that any change would be dangerous, since a white light not on the railroad might be taken as a safety signal from force of habit; second, that on our railroads, principally because of the extensive use of the permissive block system, it is necessary to have a signal for caution; and it appears difficult to find a suitable color for this purpose. Blue is not suitable, on account of its slight visibility, particularly since the light from the usual lamp flame contains few blue or violet rays. Amber or orange has been suggested, but is objectionable as being so easily confused with red (if the tint is dark), or with white (if the tint is light). This difficulty has been met on some roads, however, by using as a cautionary signal a red and a green light, or by using some combination of green lights.

This subject has frequently been considered by the official railroad organizations, especially by the American Railway Association, but no general agreement has been reached. In 1894 the Committee on Interlocking and Block Signals recommended red for danger, violet for caution and green for safety, but within a month it revised its opinion, and recommended (though not unanimously) continuing the use of green for caution and white for safety, and the Association voted against giving up the use of white as a safety signal. Later in the year the committee reported definitely that the use of blue or orange lights did not appear practicable, but that a combination of red and green could be used for caution. In March, 1895, the committe went so far as to pass the following resolution: "That the committee does not at this time deem it wise to recommend abandoning white for a night signal; as first, three indications are necessary in many cases, and second, no entirely satisfactory single color has been found for a third indication. The committee approves, however, the use of red for danger—stop, and green for clear—proceed, as good signal practice." In the standard rules for block and interlocking signals, adopted in the same year, the Association decided on red for a danger signal, but left blank the colors for safety and cautionary signals, allowing each company to decide this for itself. In the standard train rules, adopted in 1898, the same course was followed.

The opinion seems to be gaining ground, therefore, that white should be abandoned as a signal color. We conceive this to be probably the better opinion. The matter should, at all events, receive the careful attention of railroad managers.

Yellow Lights in Distant Signals.

On the semaphore signals of the Eastern District of the New York, New Haven & Hartford the spectacle castings have been changed so that at night all-clear will be indicated by a green light instead of white, as heretofore, and so that the distant signal, when the arm is in the horizontal position, will show a yellow light. On seven divisions this change went into effect on Feb. 26, and it will be made on the other three divisions, the Plymouth, the Taunton and the Cape Cod on March 5. The accompanying drawing shows the style of the arms and castings and the arrangement of the lamps. The arms of the home signals are painted red, with a white transverse stripe; those of the distant signals yellow, with a black V-shaped stripe. On the home signals, both high and dwarf, each casting has two glasses, a red and a green; on the distant signals each casting has a yellow and a green glass.



New Arrangement of Colored Glasses in Semaphore Signals on the New York, New Haven & Hartford—Eastern District.

The automatic block signals, which are of the disk pattern, and have heretofore indicated all-clear at night by a white light, have been changed so that green will take the place of white; and the use of white lights in fixed signals to indicate safety is, consequently, wholly abolished.

Discussion on the Standard Code.

Some notice of the discussion of the Standard Code of Train Rules at the fall meeting of the American Railway Association was given in the Railroad Gazette of Jan. 20. After the consideration of the fifth paragraph of the general notice there was a long debate concerning the definition of a train. According to the committee, a train is "an engine with or without cars, equipped with train signals." Attention was at once called to the fact that a train might be equipped with signals and yet the signals be not displayed. Then came the question what a section means. As every one knows, the word "section" has for years been used ambiguously, meaning, in some senses, a complete train and in other senses a part of a train. Mr. Loree moved that a section be defined as "one of a group of trains running on the same schedule." These two suggestions were finally referred to the committee, as suitable guides for their future work of revision. (Subsequently the whole code was referred back to the committee). In this discussion attention was called to the fact that markers are shown only at the rear ends of trains, while the term "signals" includes those at the front end. One member disputed the assertion that the headlight is a signal. This point was not settled, but was referred to the committee.

Among the definitions reported by the committee were the following:

Superior Train.—A train having precedence over other trains.

A train may be made superior to another train, either by right or by class.

Right is superior to class.

Train of Superior Right.—A train given precedence by train order.

Train of Superior Class.—A train given precedence by time-table.

These terms brought out a long discussion, there being under the code, as now used, two kinds of superiority of right, one by train order, and the other by schedule, and another kind of superiority by class. The definitions were finally accepted. In the course of the discussion, Mr. Knibloe said:

The value of a definition depends upon the exact and legitimate use of language—a use which you can justify by reference to the dictionary, and one which will be recognized wherever the English language is spoken. Such words as "right" and "class" go to the very foundations of the language. We cannot originate or reform the English language. Those words already have an established meaning, and we cannot change them. It seems to me that nothing less than absolute necessity would justify us in the use of words here in a forced or arbitrary sense. I am not yet prepared to believe that any such necessity exists. My objection to the definition as it stands is, that inasmuch as superiority of right is conferred as often by the time-table as by train orders, the definition in that form is not scientifically accurate. And, although I am not prepared at this moment to offer any amendment or suggestion, I still believe that it is within the scope of the English language to accurately express all the ideas involved in these definitions.

In discussing the term "pilot," there was more talk on the meaning of the word "train," and the meeting reversed its previous action by defeating a motion to ask the committee to more clearly define the difference between "train" and "section of a train." In discussing pilots it was questioned whether the responsibility of this functionary could be said to be the same as that of the conductor or engineman, or both. The pilot cannot be at both ends of the train, and yet he has important duties both at the front and at the rear. Mr. C. D. Hammond (D. & H.), asserted that he would not run a train without placing on it two men, both acquainted with the road; and he would not send one of his trains over another road unless there were two such men. The meeting finally voted to strike out the clause stating that "the responsibility of a pilot is the same as that of the engineman or conductor, or both, whom he pilots."

This ended the definitions and the general rules were taken up. The first of these is Rule A: "Employees whose duties are prescribed by these rules must provide themselves with a copy;" but how, said the first critic, do you get this rule before the employee? How is he to know that he is to provide himself with a copy of the rules; how is he to know, when employed, that there are such rules? This rude challenge of a rule which has stood unchanged for 40

years, more or less, was too abrupt a disturbance of time-honored convictions, and the motion to refer the rule back to the committee was promptly defeated.

Rule C says that special instructions must be observed while in force. There was a motion to strike out the last three words, but this also was defeated. Rule J says that passenger trainmen on duty must not use tobacco; but what does "trainmen" include? This discussion apparently came to no definite issue, the committee apparently desiring to throw the matter aside as "having no direct connection with the operation of trains." Whether or not this means that the committee will hereafter omit all reference to tobacco, remains to be seen.

After this the meeting proceeded to the discussion of the train rules proper, which have been revised so as to apply to single track only. From this point the rules are numbered beginning with No. 1, and the rearrangement is so radical that there is no correspondence with the old numbers.

In the discussion of the watch inspectors' certificate it appeared that some important roads object to having such a certificate, and there was a proposition to so construct the rule concerning watches that it could easily be adapted to use either with or without certificates. The question then arose whether other employees than conductors and enginemen should be required to carry approved watches, but the convention took no action on it. The correctness of the phrase "run within a variation of not over 30 seconds per week" was criticised, and there seemed to be some surprise that this rule should have stood 12 years without the redundancy being noticed. The words "not over" were finally stricken out.

The definitions of color signals, also of hand, lamp, steam-whistle and air-whistle signals are arranged on the plan employed in the description of home and distant signals in that part of the code referring to block signals. Rule 10 describes what red, white and green mean. The term "danger" is everywhere eliminated. Rule 12 describes all the hand signals. As in the old code, the two clauses describing signals made by swinging a lantern, both omit to say which way it shall be swung, though in the diagrams the "back-up" signal is swung over to the left, while the train-parted signal is swung over to the right. The code gives the signal for applying the air brakes (a lantern swung horizontally in a circle), and the signal for releasing air brakes (a lantern held at arm's length above the head). These are used only when the train is standing. Rule 14 includes all the steam-whistle signals. A note says that the intensity and duration of the sound should be proportionate to the distance the signal is to be conveyed. Four long blasts call in the flagman from west or south, and five long blasts from east or north. For the signal approaching a station the length of the blast is represented as more than twice as great as that of the so-called long blasts in the other signals. As a blast of more than three seconds' duration is an outrage on persons living near whistling posts, and as one of two seconds is amply sufficient for a station signal, we assume that the committee intends to make the first two blasts of the highway signal of only about one second duration each. This is highly commendable. Possibly the lengths of the sounds are not correctly shown by the printer; we notice that the five dashes for calling in flagmen from the east are about equal in the aggregate to the four for calling in from the west.

With the air whistle (train standing), five blasts signify call in the flagman, four signify release the air brakes; when a train is running, four sounds signify reduce speed.

In the discussion of the color signals, Mr. Ramsey, of the Wabash, desired to have blanks left in the rule so that a road using green for all-clear could use the standard phraseology with the same facility as one using white for all clear. At St. Louis the former practice now prevails, and Mr. Ramsey thinks that within a few years a great many more roads will adopt it. The meeting voted to leave these places blank.

There was considerable objection to the use of blue flags and lanterns by car repairers. Some roads have abandoned these and use a red signal. The Delaware & Hudson uses a blue light and places a red light near it, to draw attention to it; in the daytime car repairers use a flag, which is half blue and half red. Instances were given where blue signals had been displayed, but were not seen, and men were thereby run over and killed. One superintendent thought that there were more roads using red than blue. One manager of long experience had, however, found no trouble with the blue, and the meeting refused to request the committee to make any change.

Following this there was a criticism of the two short whistle-blasts as an answer to any signal. Conductors approaching meeting points have assumed that their enginemen were preparing to stop because they heard this whistle signal, when, in fact, the engineman, had forgotten his stop orders and was sounding the two blasts in reply perhaps to a trackman. Mr. Ramsey moved that the committee suggest an air-whistle signal for giving notice to the engineman that he was approaching a station where he had to stop. This was carried; but then a further question was brought up; a conductor signals to the engineman that he must stop at the next station; at the same time a flagman is trying to stop the train before it reaches the station; the flagman hears the engineman acknowledge the conductor's signal, thinks this is an answer to his own and goes back to his own train. The meeting refused to consider this point, having evidently got tired of this branch of the subject. This subject came up later on the presentation of the criticism that a conductor may signal to stop at the next station while a man on the track may be signaling all right, so that the two blasts may mean both stop and go ahead. This complication had happened on one road, though no collision ensued. On the Wabash one long and two short blasts are used as a response to a signal to stop. The proposition to refer this matter to the committee was, however, defeated.

Rule 31 requires the engine bell to be rung on approaching public road crossings, but it does not say how far in advance of the crossing the ringing must begin. There was no comment on this.

Rule 33 provides that green signals must be used by watchmen at street crossings. There was a proposition that a blank be left in this rule, so that a road might adopt any color it chose. This was defeated, but afterwards was reconsidered and carried. A member of the committee said that green was prescribed because an enginemen, seeing the watchman's signal at a crossing, proceeds at caution. The absurdity of this view was not recognized for some time, but finally it was made clear that the crossing watchman's lantern should have nothing to do with the running of trains.

Rule 82 is substantially the same as old rule 395. It was pointed out that this should require conductors to ascertain whether all trains have arrived, not ascertain that all trains have arrived. This was finally referred back to the committee.

Rules 86 and 88 say that trains "must pull into the siding." The fact that a train has to be propelled by the engine, and that of the whole train, nineteen-twentieths, more or less, does no pulling, seems to have been overlooked by the critics.

Rule 94 is the same as old rule 407, but the number of hours is left blank. After a brief discussion it was voted by a large majority to restore the word "twelve."

Rule 95 forbids carrying signals without orders "from the Superintendent, or other authority designated by him," and there was a motion to leave a blank here so that "train dispatcher" might be inserted, but this was defeated. In rule 96 the words "or other authority," etc., do not appear, and this inconsistency was referred to the committee for acion.

At this point the Convention reached the flagging rules, the discussion on which was reported in our previous article. The discussion of the rules beyond No. 99 we must postpone until a future issue.

The Waterloo & City Railway—London.

Considerable alterations have been made in certain details of working this line, as the result of the first few months' running. These go to show that traveling on underground electric railroads will be materially different from what people have been accustomed to on the Metropolitan and District Railways. These have been reproductions below ground of the steam railroads above. On the new lines, on the other hand, a mixture of tramway and American railroad practice is likely to be found.

On the Waterloo & City Railway the fares are now paid in the train, instead of at a box with a turnstile. It was found that so many passengers held season tickets, or returns, or through tickets from the London & South Western, that it was hardly worth while keeping booking clerks on duty all day. Two guards accompany each train, attending to two coaches and examining the tickets. Those who have none pay in the train, receiving a little ticket which the guard perforates with a bell-punch. He carries the small electric lamp slung round his neck, which the L. & S. W. RR. ticket-collectors use at Vauxhall. The tickets are not collected from the passengers, except return tickets on the second using of them. This saves much delay and consequent blocking-up of the station, a matter of particular importance at the city end in the morning. Down-journey tickets are now yellow, up are green, returns white.

Another improvement is the sale of books of tickets, 12 single-journey tickets costing 2s., while 25 may be had for 4s. These may be used in either direction, and are obtained from the inspector on duty; but they may also be got at all South Western stations, which book through to the city. The season-ticket rates are reasonable enough, being £3 for a year, £1 12s. 6d. for six months, 17s. 6d. for three months, and for shorter periods 6s. per month, the length of the line being only 1½ miles, with but one class of carriage. Most of the South Western stations within 25 miles of London issue season and ordinary tickets available over that line up to Waterloo, and on to the city over the electric railroad.

Trains leave Waterloo every six minutes from 8 A. M. till 11 A. M., and from 4 P. M. till 7 P. M., beginning at the hour. The rest of the day they start every 10 minutes, also beginning at the hour. These appear to meet the public wants. It is doubtful if a greater service than every six minutes could be given, as the journey takes five, and the nature of the tunnel renders any intermediate block signaling station out of the question.

The running of the trains continues to be extremely smooth and steady, creditable alike to the coaches and to the permanent way. When going fast down-hill the noise, due to the smallness of the tunnels, is greater than on the steam underground lines, but the end doors are kept shut and the side windows do not open, so that it is minimized so far as possible. Were there any openings save the ventilators both the noise and the draught would be very unpleasant. Passengers are strictly prohibited from standing on the end platforms between the coaches during the journey.

So far no weekly statements of the receipts of the Waterloo & City Railway have been published, as they are merged in those of the London & South Western, which works and virtually owns the line. A dividend at the rate of 3 per cent. for the barely five months' working has just been declared. This very satisfactory result cannot fail to have a most important effect upon the future of underground electric transit in London. W. B. PALEY.

Chelsea, London S. W., Jan. 28, 1899.

TECHNICAL.

Manufacturing and Business.

A correspondent reminds us that in our notice of the fast runs of the mail trains west of Chicago early in January, we omitted to mention the run of train No. 9 over the Chicago, St. Paul, Minneapolis & Omaha on Jan. 11. This run, which is said to have been the best ever made over that part of the road, was from Elroy to St. Paul, 195 miles, and the time, exclusive of stops, was 198 minutes. The engine was No. 278, which, like most of the engines on that road, has Ajax metal bearings. The train was made up of six heavy cars to Eau Claire, and five the rest of the way.

Sooysmith & Co. and the Engineering Contract Co. have removed their offices from the Mills Building to the Empire Building, 71, Broadway, New York.

Mr. J. F. Keeney, a contractor doing some heavy levee work at Cairo, Ill., writes to the F. C. Austin Mfg. Co. concerning the New Era grader and wagon loader, saying that the machine has far exceeded his expectations. In speaking of the steel machine, which "is stronger and lighter draft than any wooden machine," he says he has loaded 133 wagons in 54 minutes. He believes that he can load from 1,000 to 1,200 wagons in 10 hours if the wagons can get under the carrier. His blacksmith bill on the grader in three months has been $1.35.

Two designs of illuminating torches, one for gasoline and the other for kerosene, have been placed on the market by Mr. C. G. Smith of New York. The torches each give a light of 5,000 c. p., and are intended for general construction work.

Mr. Joseph Read Patterson has been admitted as a partner in the firm of Fearon, Daniel & Co. of Shanghai and New York.

Ground was broken Feb. 27 at South Chicago for the cement factory for the Illinois Steel Co., adjoining two of its blast furnaces.

American Car and Foundry Co.

The permanent organization of this company has been effected. The Board of Directors is as follows: William McMillan, of Detroit, Chairman; William K. Bixby, of St. Louis; H. B. Denker, St. Charles, Mo.; J. L. Smyser, Jeffersonville, Ind.; Frederick H. Eaton, Berwick, Pa.; J. J. Albright, Buffalo, N. Y.; Chester Griswold, New York city; Lewis J. Cox, Terre Haute, Ind.; George Hargreaves, Detroit, Mich.; F. E. Canda, Huntington, West Va.; O. W. Meysenburg, Chicago; Charles T. Schoen, Pittsburg; E. N. Dickerson, New York city; Anthony Gref, Jersey City, and George Coppell, New York city.

The following officers were elected for the ensuing year: William K. Bixby, President; Frederick H. Eaton, Vice-President; Anthony Gref, Secretary. The Treasurer will be chosen this week.

The reports received from the various branches show that the unfilled orders upon the books of the company to-day exceed 27,000 freight and passenger cars and 100,000 car wheels.

Electricity on Naval Vessels.

Last week the Assistant Secretary of the Navy, Mr. Allen, decided in the matter of the use of electricity for driving machinery on the new battleships. The effect of the decision will be to go back to steam power for the smaller and less important machinery, but has nothing to do with the present or future use of electricity for turning turrets or for ammunition hoists and ventilating sets. The question which Mr. Allen has decided was raised when the power that should be used for boat cranes, pumps and in the machine shops was being considered, and his opinion has nothing to do in deciding the relative merits

of steam and electricity for driving the more important machinery on warships.

New York Central Clearing House.

The New York Central and its controlled roads are to have a clearing house for freight accounts. The new office will be established at Buffalo April 1, and it will be in charge of Mr. William Nicholson, hitherto Auditor of the Fall Brook Railway. Heretofore all freight billed through over the New York Central and the West Shore on the east, and the Michigan Central and the Lake Shore & Michigan Southern on the west, has been also rebilled at Buffalo. All settlements were made between the agents at Buffalo and the billing and the proportions were computed by each road separately, the same as though there had been no community of ownership. Now, however, the purchase of the whole of the stock of the two western lines by the Central makes it possible to establish audit-office settlements, and junction settlements will be entirely abandoned. Through way bills passing through Buffalo will be dealt with by the agent in the same manner as those passing through any junction on the New York Central proper, as, for instance, the junction of the R. W. & O. with the main line at Utica or Rome.

The Ton Mile.

The Master Mechanics' Committee on "Advantages of the Ton Mile Basis for Motive Power Statistics," has sent out the following circular:

To enable the committee to compile a report to be presented to the next convention, please advise upon what basis you are computing cost of locomotive service; give an explanation of the method you pursue in tabulating same, and send a copy of the form on which your statement of such cost is presented.

Please also advise which, in your opinion, of the units, locomotive mile, car mile or ton mile, now commonly used as a basis for such calculations, do you consider as best adapted for the general purpose of comparing locomotive expense; also which in comparing individual locomotive performance.

What other basis, if any, for such calculations presents itself as being feasible and desirable?

The committee requests that replies be made in full and forwarded at as early a date as possible to H. J. Small, Chairman, care Southern Pacific Co., Sacramento, Cal.

Automatic Block Signaling.

The Pittsburgh & Lake Erie has lately put up 16 automatic block signals of the Union Switch & Signal Company's electrically operated semaphore pattern. This signal was described in the Railroad Gazette of Dec. 3, 1897.

The Philadelphia & Reading has contracted with the Hall Signal Co. for automatic block signals on the New York Division from Bethayres, Pa., eastward to Trenton Junction, about 20 miles. The signals, like those already in use on the Reading, will be of the disk pattern, with distant signals for each block. On the completion of this installation, the road will be block-signaled from Philadelphia to Trenton Junction, 37 miles.

The Hall Signal Co. is to put in automatic block signals on the rebuilt Victoria bridge of the Grand Trunk at Montreal. These signals will be of the disk pattern, and will stand normally at all-clear. The length of road protected, including the bridge, is about 2½ miles, double track, and there will be four block sections on each track.

The Hall Signal Co. is putting in 65 automatic semaphore signals on the Cincinnati, New Orleans & Texas Pacific. These signals will be operated by electric motors, a motor being placed at the bottom of each post, and will stand normally at all-clear.

Electric Power Development at Niagara Falls.

It is stated that the Canadian Electric Power Co. has made a formal offer of $25,000 a year to the Niagara Falls Park Co. for the right to build a tail race through the park for the purpose of generating electric power amounting to 150,000 h. p. The company believes that a demand exists for this power, and offers to deposit $100,000 on signing of a contract.

Masonry Dry Docks.

The necessary authority for building three masonry dry docks was inserted in the Naval Appropriation bill on Tuesday of this week, and it is quite likely that the measure will be passed. The amendment which the Sub-Committee on Appropriations agreed to provides that $825,000 be divided into three equal parts, to be used for building the dry docks at Portsmouth, N. Y., at League Island, Pa., and at Mare Island, California, of stone and concrete, instead of wood.

THE SCRAP HEAP.

Acetylene hand lamps are being tried on the Columbus, Hocking Valley & Toledo.

After April 1 employees of the Baltimore & Ohio are to be paid by check instead of in cash, as at present.

The Cleveland, Cincinnati, Chicago & St. Louis has issued orders to have freight trains made up on the tonnage basis.

New Hampshire newspapers report that section masters of the Boston & Maine have orders to forbid the use of the track or roadway by bicyclists.

The Postal Telegraph & Cable Co. has petitioned the United States Circuit Court at Cleveland for the right to erect a telegraph line along the right of way of the Cleveland, Cincinnati, Chicago & St. Louis, from Cleveland, O., to Union City, Ind.

The Brotherhood of Railway Trackmen of America is the last organization launched. According to the Concord (N. H.) Patriot, this brotherhood was established at West Concord, N. H., on Feb. 16. The Division Chief is F. F. Tucker of the Boston & Maine, West Concord.

The employees of the Brooklyn Heights (Street) Railroad have started a mutual benefit association. The members are to pay dues of $1 each monthly, and the death benefit is to be $200. The sick benefit will be $1 a day. The Treasurer of the railroad company will be Treasurer of the association.

At Cherryvale, Kan., on the morning of Feb. 21, about 7 o'clock, the express car in a passenger train of the Atchison, Topeka & Santa Fe was robbed of $60,000, while the train was standing on a side track. There was a dense fog at the time, and the express messenger had gone to a hotel near by to eat his breakfast, leaving the car locked.

Press dispatches from Omaha indicate that the order of the United States Court requiring the Western Union Telegraph Company to separate its business from that of the Union Pacific Railroad will soon be carried out, the appeals, which have been under consideration since the decision, having been finally decided against the Western Union.

The Attorney-General of Ohio has filed quo warranto proceedings in the Supreme Court at Columbus against the Pittsburgh, Cincinnati, Chicago & St. Louis and the Cincinnati, Hamilton & Dayton, to compel them to relinquish their membership in the Central Passenger Association, which association, it is claimed, is unlawful as being in restraint of trade.

The station agents on the Chicago Division of the Erie road have been supplied with light wooden hoops, about 18 in. in diameter, for use in delivering train orders to enginemen and conductors who do not stop at the station. The hoop is attached to a stick about four feet long, and the station man can thus easily hold it where the trainman can run his arm through it at any ordinary speed.

The British Columbia Legislature, in considering a number of bills for chartering new railroad companies, has added various restrictive clauses which have not been common heretofore. One stipulates that neither Chinese nor Japanese "cheap labor" shall be employed either in the construction of the road or in its operation after finished. Another is that if a company secures a subsidy from the Dominion after receiving one from the Province, the latter shall become void; in other words, it is forbidden that the same company receive subsidies from both governments.

In Georgia it appears that the law against unnecessary Sunday traffic on railroads is more strictly enforced than in some other States. In Atlanta recently it was found that freight cars were being switched on Sunday more than appeared to be allowed by the legal regulations, and the Mayor ordered the Chief of Police to see that the city ordinances were obeyed. The railroads ask that perishable freight be allowed to move, and it seems likely that their request will be granted; but the difficulty arose over assertions that many cars of non-perishable freight were switched, along with those which contained live stock, fruit, etc.

Albert J. Geis, a Chicago ticket broker, who was indicted for violating the state law nearly a year ago, has been released, Judge Gibbons of the State Circuit Court holding, in habeas corpus proceedings, that the law is unconstitutional. The Judge says that the buyer of a ticket may hold it absolutely as property, the same as a coat, and he intimates that the Legislature, in making a law of this kind, was exercising arbitrary and despotic power. Ticket brokers seldom occupy the attention of the courts, and this, he says, is prima facie evidence that they deal fairly with their patrons and are not such lawbreakers as might be inferred from the terms of the anti-scalper laws.

Consolidation of Car Works in Europe.

There are five car-building works in Austria. These have joined and agreed with a similar combination of car works in Germany, by which the German works promise not to bid for Austrian contracts and the Austrian works let German contracts alone. But there are also five car works in Hungary, which have not been so bound. These have recently been negotiating with the Austrian works, and a combination of the car-builders of the three countries seems probable.

A Chicago Tower.

The new building under construction for Montgomery Ward & Co., Chicago, on Michigan Ave., between Washington and Madison Sts., will have a tower 380 ft. high and 40 ft. square, in the middle of the Michigan Ave. front, which will be used for the offices of the firm. The tower will be built of steel and terra cotta, and its foundations will extend about 70 ft. below the street and about 50 ft. will be piling. This tower will be higher than that of the Auditorium, the Masonic Temple or the Ferris Wheel.

Railroad Employees in Europe.

Those who are interested in the study of the condition of the great mass of railroad employees—all below the grade of officers—should procure the bulletin of the United States Department of Labor, No. 20, for January. It contains a paper of 117 pages by Dr. Walter E. Weyl of the University of Pennsylvania on the "Condition of Railway Labor in Europe." It is a very elaborate study of hours of work, wages, pension and relief arrangements, strikes, arbitrations, accidents, etc. It has the great merit of being carefully statistical and specific; it is a collection of facts and not a generalization or speculation.

Canadian Railroad Subsidies for 1898.

The report of the Commissioner of Public Works for the Province of Quebec shows that there are 3,377 miles of railroad in operation in the Province, to which the following amounts have been paid in land and cash subsidies during 1898: Quebec, Montmorency & Charlevoix, $15,191; East Richelieu Valley, $50,000; Great Northern, $125,253; Baies des Chaleurs, $9,555; Montreal & Lake Maskinonge, $11,375. The obligations of the Quebec Government toward railroads, due partly on Dec. 31, 1898, and partly on Dec. 31, 1899, amount to $970,633. The Province of Ontario paid out for railroad subsidies in her territory during the same period $125,650.

Vienna Elevated Railroads.

The new city elevated railroad system of Vienna, which is in some degree comparable with the New York elevated railroads, has cost about $29,000,000. As on the Berlin elevated line, only second and third class cars are run. The fares are for three zones. For the first, 3 kilometres (1.86 miles) or less, the charge is 2 cents third class and 3 cents second class. For the second zone, including distances up to 5 miles, the fares are 4 cents and 6 cents; for the third zone (all distances over 5 miles), 6 cents and 9 cents. The low rates for short distances are intended to enable this road to compete with the street railroads. At present the city railroad has only about 25,000 passengers daily.

New Passenger Transfer Station in Chicago.

An important addition to the railroad pasenger facilities of Chicago has just been made in the new union station that has just been opened in Chicago by the Pennsylvania, the Lake Shore and the Rock Island roads at Sixty-third street. In fact, the officers of these companies hope to deal with a good share of the through interchange travel between the East and the West at this station. The building is large and commodious, and on a level with the elevated tracks, steps leading down to the street. It is seven miles from here to the terminal stations of the three lines, and travelers changing at Sixty-third street will thus save 14 miles, to say nothing of the added convenience resulting from less confusion.

Telephones in Chicago.

At the City Council meeting Feb. 20, the ordinance for the Illinois Telephone & Telegraph Co. mentioned in our issue of last week, page 144, was again amended to provide for the regulation of rates by the city in the future. This amendment was made to meet Mayor Harrison's wishes, and the ordinance finally passed by a vote of 54 to 4. Mr. C. H. Aldrich, counsel for the company, has furnished Mayor Harrison with the names of 20 of the backers of the new company, most of whom are St. Louis men. The capital stock of the company is $5,000,000, and it is announced that active operations will begin at once and that the new company will have numerous toll lines to other cities besides its Chicago exchange.

Self-Propelled Omnibuses Between Stations in Paris.

The French Department of the Meuse has made a formal contract with two persons for running a regular line of self-moving omnibuses over a public highway 12 miles long, between two railroad stations. The vehicles are to have seats for 14 passengers, make the round trip at least three times daily, and the fare is limited to 3⅛ cents per mile. Express goods will be carried on these vehicles, which must be able to carry 2,200 lbs. of goods, besides the passengers. The speed is limited to 12½ miles an hour. The contract also provides for the carriage of ordinary freight by a traction engine drawing two wagons, with an aggregate capacity of 11,000 lbs. Two classes of freight are provided for, with maximum rates of 12 and 15 cents per ton per mile. A subsidy is granted for both passenger and freight service.

Consolidation of Ferries at Camden.

A press dispatch of Feb. 23 says that the Camden & Philadelphia and the West Jersey Ferry companies are to merge. Both companies are under control of the Pennsylvania Railroad. Both ferries run from the foot of Market Street, Philadelphia, but the West Jersey touches at Market Street, Camden, and the Camden & Philadelphia at the Pennsylvania Railroad terminal, at Federal Street. The most important feature of the merger is the concentration of the two ferries under one roof in Camden, the same as in Philadelphia. The companies have acquired all the land between Federal and Market Streets, Camden, upon which it is expected that a large new structure will be built. When the old Broad Street Station in Philadelphia was torn down all the steel work was hauled to Pavonia and carefully marked and stored away alongside the tracks, ready to be reerected as a trainshed for the proposed new Camden station.

The Reading Subway in Philadelphia.

The February issue of the proceedings of the Engineers' Club of Philadelphia contains a long article on the "Pennsylvania Avenue Subway and Tunnel" by Mr. George S. Webster. This is a description of the work done in abolishing 17 grade crossings on the Philadelphia & Reading Railroad on the line of Pennsylvania avenue. This involved an expenditure of about $6,000,000. The description is quite detailed and very well illustrated.

A Lost Opportunity.

After reciting the numerous uses of electricity in railroad working the Zeitung des Vereins expresses its astonishment that the Prussian Government has not created a director of electricity. The Journal des Transport, in commenting on this, says that no doubt such an office ought to be created also in France. It does seem a pity that this beautiful opportunity for more bureau control should have been so long neglected.

Holland's Acetylene Headlight.

Mr. A. S. Holland, of Ottawa, Can., has had considerable success in his attempts to use acetylene gas for a locomotive headlight. His apparatus is simple, consisting of a generator, water reservoir and condenser. The generator is a cast iron cylinder, about 5 in. in diameter by 1 ft. in height. In this generator is put a wire basket, which can hold a charge of 10

lbs. of carbide, and supported in place by a frame having four legs and resting on the cast iron disc, which is firmly clamped to the bottom of the cylinder during the generation of the gas. This generator is fastened at its upper end to a block of wood, and connects with the water reservoir, which is of smaller diameter and about two feet in height placed directly over generator. The water, dropping on the carbide, generates the acetylene gas, which is led through a small pipe to a jet in front of the reflector. Precautions are taken to prevent the water in the generator from freezing. It is claimed that no more expert knowledge or skill is required to manage the acetylene generator than is required for an ordinary coal oil lamp. An order has just been given by the Canada Atlantic Railroad to put the apparatus on one of their shunting engines.

Cheap Labor on the Simplon Tunnel.

About 1,000 laborers, all Italians, are employed at Brieg, the Swiss end of the Simplon Tunnel. Those employed outside, exposed to Alpine winter weather, frequently soaked through with rain and wet snow, receive daily wages of 55 to 58 cents; those working in the tunnel, now about 1,000 ft. long, get 58 to 63 cents. A very large part of them have left families on the other side of the Alps, to which part of their wages go, and it is believed that the majority spend not more than 20 cents a day for their own subsistence, which generally consists of coffee and bread in the morning, macaroni at noon, and bread and soup for supper, with some boiled meat Sundays. To get cheap lodgings they have their quarters not in Brieg, where the tunnel begins, but in Naters, on the other side of the Rhone, so that they have a considerable walk after their work, when the tunnel workmen especially are likely to be wet and exhausted, coming from their eight hours' shift underground. It is therefore feared that hundreds will lose their lives on this work, as was the case during the construction of the St. Gothard Tunnel. Notwithstanding all this, great numbers of unemployed workmen are on hand waiting for a chance to fill any vacancy that may occur, for the misery they come to seems less than that which they leave behind.

Fishing a Train Out of a River.

A 56-ton locomotive of the Philadelphia, Wilmington & Baltimore Railroad and two freight cars went through the open draw of the bridge over the Brandywine River on Feb. 24, and, after two days' work, the cars and tender were recovered by the Delaware Construction Company. The water in the Brandywine is shallow, and the Delaware Construction Company had much trouble in getting its tug boats to tow big barges and dredging machines up to the scene of the accident. A lare float was stationed at the side of a big mud dredge, the latter having been stripped of its digging machinery and heavy blocks and tackles placed on the crane. Divers put chains around the cars. The machinery on the dredge was started and the cars were lifted from the water and placed on the barge. The work of recovering the two freight cars was accomplished in little more than half a day. The greatest difficulty was encountered in trying to save one of the cars, which hung on the abutment of the bridge. It was first hauled from the abutment into the stream and then lifted out of the water and placed on the barge. It took another half day to recover the tender and the trucks of the two cars. A delay then ensued, as the Construction Company had to wait for a high enough tide to float the barge around into the Christiana River to the shops of the Railroad Company. The locomotive is expected to be recovered within a day after operations on it commence.

Thawing Water Pipes by Electricity.

Profs. Jackson and Wood, of the University of Wisconsin at Madison, have during the recent cold weather demonstrated that it is entirely practicable to thaw out frozen water pipes by an electric current, and thus avoid tearing up lawns and paved streets. The method is adaptable to the conditions in almost any city, and requires a suitable electric current, a means for controlling the current, and conducting wires. The scheme is to place the frozen section of water pipe in circuit by connecting the wires to the pipe on either side of the frozen portion, and allowing the current to flow until the pipe is thawed out. There are no patents covering this process, and any one is free to use it. In reply to our inquiry about the working of this method, Prof. Jackson writes: "I am pleased to say that the electric thawing process referred to is an entire success. For thawing service pipes we use from 200 to 300 amperes at a pressure of from 50 to 60 volts at the source of current. The actual pressure required to force current through the pipe and connections is often considerably less than that named, but a water rheostat conveniently controls the flow. For thawing cast-iron mains up to 6 in. or 8 in. diameter, I propose to use as much as 1,000 amperes at a pressure of 100 to 250 volts. The duration of the thawing process is so limited and the earth conditions are such that I do not anticipate any injury from electrolysis at the pipe joints. The time occupied after the current is turned on before the water flows is ordinarily considerably less than a half hour. It is necessary to use a source of current which does not affect the electric light lines by the grounding effected through connecting with the pipe, or danger may result. The method is already being used with the greatest satisfaction all over this state and elsewhere."

Rowland's Multiplex Printing Telegraph.

Dr. Henry A. Rowland's multiplex telegraph, briefly described in the Railroad Gazette of Jan. 6, page 12, has been tried on the wires of the Pennsylvania Railroad between Philadelphia and Jersey City. The inventor declines to publish a full description of his apparatus, but a statement is issued explaining a few of its peculiarities. Any number of messages up to the limit of the capacity of the machine may be sent in either direction. That is to say, eight may be sent all in one direction, or six one way and two the other, or any other combination. The receiving instruments, which print in Roman letters, on paper tape, need no more attention than other printing telegraphs, and one operator can attend to a number of receivers. It is stated that only one letter is sent at a time, so that if eight sending machines make eight letters simultaneously a selecter picks out the letters in proper order and sends one of them at a time.

On the line the alternating current is used, but the printing instruments are operated by a local direct current. The printing instruments at the opposite ends of the line must run at exactly the same speed. Prof. Rowland claims that his method of producing this synchronism is more certain than any heretofore used. In general, the method is the same as the control of an alternating current motor by the generator. The two get "in step" with each other. There are, however, auxiliary means for keeping them in step by the transmission of retarding or accelerating impulses over the line.

The apparatus consists of an alternator, run by an electric motor at a definite rate of speed. Upon the axis of the alternator is an armature with alternate plus and minus segments, over 50 in number. These segments are led in pairs by wires to the keys of a typewriter, two segments for each letter or character. A letter can be struck at each revolution of the armature on each of the four typewriters at the sending end of the line.

At the other end of the line the impulses from the two segments, when a letter is struck on the typewriter, are received on the corresponding segments of the receiving armature, and close a local circuit which prints the same letter. The printing can be done on a letter sheet as well as on a tape.

It is said that Baltimore capitalists will aid Prof. Rowland in forming a company to make the machines.

Technical Schools.

Cornell University.—The Sibley Journal of Engineering for February gives a list of the thesis subjects of the graduating classes in Sibley College. Among others are the following: "Some Leading Improvements in Locomotive Design," "Investigation of Blowers and Mechanical Draft," "Tests of Malleable Cast Iron," "Test of Compound Locomotive," "Compressed Air Tools," "Economy of Steam Under High Back Pressure" and "Test of a Westinghouse Gas Engine." Included in the list are tests of about five electrical generating plants and about as many in electrical machinery.

Columbia University.—The locomotive "Columbia," (without the tender), which was shown at the Chicago Exposition, in 1893, and illustrated and described in our issue of May 26 of that year, has been put in place in the testing laboratory in the basement of the Engineering Building at Columbia University. No attempt will be made, however, to make regular tests on the engine in the present college year, and it may be late in the Fall before very much is done. At present the Mechanical Engineering Department is handicapped because of insufficient testing apparatus, principally a suitable dynamometer.

Lehigh University.—The announcement has been made that during the Summer courses will be given in chemistry, physics, surveying, mathematics, English, history, political economy, ancient and modern languages. The instruction will be mainly adapted for teachers in secondary schools. In chemisty, physics and surveying practical exercises will be included in the instruction. It is requested that any desirous of taking any of these courses will notify the Secretary of the Lehigh University, South Bethlehem, Pa., as early as possible.

Armour Institute, Chicago.—On Feb. 20, it was announced that Mr. P. D. Armour has given to the institute $750,000 as an additional endowment. Of this amount $500,000 is in securities and $250,000 in real estate adjacent to the institute building. This gift makes a total of about $3,000,000 which Mr. Armour has given to the institute, and it is probable that the amount just given will be used for the extension of the work of the school, including a new building and one or two additional courses of engineering study.

LOCOMOTIVE BUILDING.

The Baldwin Locomotive Works is building one 8-wheel for the Queen Anne's R.R.

The Dominion Coal Co. is reported in the market for one passenger and two freight engines.

The Midland Ry. (England) has ordered 10 more locomotives from the Baldwin Locomotive Works.

The Missouri Pacific has placed an order for 10 freight locomotives with the Rogers Locomotive Co.

The Duluth & Iron Range has ordered four 12-wheel freight locomotives from the Baldwin Locomotive Works.

The Carnegie Steel Co., Ltd., has ordered two 6-wheel switching engines from the Baldwin Locomotive Works.

The Union Terminal Association of Detroit has ordered one switching engine from the Baldwin Locomotive Works.

The Pennsylvania has placed an order with the Baldwin Locomotive Works for building 25 Class H-6 consolidation engines.

The Duluth, Missabe & Northern has ordered four locomotives from the Pittsburgh Locomotive & Car Works.

It is reported that the Missouri, Kansas & Texas has ordered five locomotives from the Baldwin Locomotive Works.

The Texas & Pacific has ordered two more engines from the Rogers Locomotive Co., to be duplicates of those previously built.

The West Virginia Central & Pittsburgh has placed an order with the Rogers Locomotive Co. for building one switching engine.

The Chicago, Burlington & Quincy has ordered 15 class H mogul engines from the Baldwin Locomotive Works, to have 19 in. x 26 in. cylinders.

The Detroit, Grand Rapids & Western has ordered one six-wheel switching engine with 17 in. x 24 in. cylinders from the Baldwin Locomotive Works.

It is stated that the Chateaugay will buy some locomotives for use on the road between Plattsburg and Cadyville, now being changed to standard gage.

It is reported that the Atchison, Topeka & Santa Fe is considering buying 15 more locomotives, but no definite information was obtainable at time of going to press.

The Detroit & Mackinac has ordered the two 10-wheel freight engines, previously referred to, from the Baldwin Locomotive Works. They will have 18 in. x 24 in. cylinders.

The Mexican International has ordered five simple mogul locomotives from the Cooke Locomotive & Machine Co., with cylinders 20 in. x 26 in., and a total weight of about 144,000 lbs.

The Missouri Pacific has ordered 10 freight engines from the Rogers Locomotive Co. They will be duplicates of the 10-wheelers built by the same works for the Missouri Pacific last summer.

The Chicago & Northwestern has ordered five more class R 10-wheel freight locomotives from the Baldwin Locomotive Works, to be duplicates of the five previously ordered from the same builder and noted in our issue of Jan. 14.

The Lorain Steel Co. has ordered from the Cooke Locomotive & Machine Co. one six-wheel switching engine with cylinders 18 in. x 24 in. This engine is to be a duplicate of one built last spring for the Lorain Company by the Cooke Works.

The Chicago, Milwaukee & St. Paul has ordered 20 more compound locomotives from the Baldwin Locomotive Works for delivery the latter part of next summer. They will be of the Vauclain type with 62 in. driving wheels and will weigh 120,000 lbs. on the drivers. It is understood that the details of these engines have not all been decided upon as yet.

The two engines ordered from the Richmond Locomotive & Machine Works by the Brainerd & Northern Minnesota, and referred to in our issue of Feb. 17, will be of the compound mogul type, for delivery April 25. They will weigh 104,000 lbs., with 85,000 lbs. on the driving wheels and have 18-in and 28½-in. x 26-in. cylinders, 57-in. driving wheels, extended wagon-top type boilers, with a working steam pressure of 200 lbs.; fireboxes, 93 in. long and 34 in. wide, and a tender capacity for 3,500 gals of water and 7 tons of coal. The engines will be equipped with Westinghouse brakes and Coffin toughened process steel axles.

The Baldwin Locomotive Works are building one simple and one compound consolidation locomotive for the Lehigh Valley. The former will have 21-in. x 30-in. and the latter 17-in. and 28-in. x 30-in. cylinders. Both types will weigh 175,000 lbs., with 155,000 lbs. on the driving wheels and have 62-in. drivers, working steam pressure 200 lbs.; fireboxes, 114½ in. long and 96 in. wide, and tender capacity, 4,500 gals. of water and 13 tons of coal. The specifications call for American driving and Westinghouse tender brakes, open hearth steel axles, Sterlingworth brake beams, Gould pilot and tender couplers, Leach sanding devices, Nathan lubricators with Tippet's attachment, Latrobe tires, cast steel wheel centers and nickel steel piston rods (hollow).

The Mexican Central has ordered in all 38 consolidation locomotives, 34 from the Baldwin Locomotive Works and four from the Rogers Locomotive Co. They will weigh 180,000 lbs., with 160,000 lbs. on the driving wheels, and have 21-in x 26-in. cylinders; 55-in. driving wheels; Belpaire boilers; working steam pressure, 180 lbs.; fireboxes, 121 in. long and 38½ in. wide, and tender capacity, 4,500 gals. of water and 8 tons of coal. The engines will be equipped with Westinghouse brakes, hammered iron axles, Player brake beams, Bullnose couplers, No. 10 Freidman injectors, M. C. piston and valve rod packings, Crosby safety valves, Nathan No. 9 triple sight-feed lubricators, Scott springs and Crosby steam gages.

The Wabash has ordered from the Rhode Island Locomotive Works three simple eight-wheel, 15 simple mogul, and two six-wheel switching engines. The eight-wheel locomotives will have cylinders 18½ in. x 26 in.; a total weight of 121,000 lbs., of which 79,000 lbs. will be on the drivers; diameter of driving wheels, 73 in. The boilers will be of the extended wagon top type and the working steam pressure, 190 lbs. The fireboxes will be 75⅝ in. long and 34⅝ in. wide. The mogul engines will have cylinders 19 in. x 28 in.; drivers, 63 in. in diameter; weight on drivers, 110,000 lbs., and total weight, 128,000 lbs. The boilers will be of the straight top type; working steam pressure, 185 lbs.; fireboxes, 108 in. long and 41⅝ in. wide. The switching engines will have cylinders 18 in. x 24 in.; drivers, 51 in. in diam.; weight, 96,000 lbs. The boilers will be of the straight top type, with radial stays; working steam pressure, 165 lbs.; fireboxes, 84 in. long and 33⅜ in. wide; tender capacity for water, 3,000 gals., and coal, five tons. The eight-wheel and mogul engines will have tender capacity of 4,500 gals. and coal, 10 tons. All of the 20 engines will be equipped with mild steel axles; Sterlingworth brake beams; Gould couplers; Ohio injectors; Crosby muffled safety valves; Houston sanding devices; Michigan sight-feed lubricators; Charles Scott Spring Co.'s springs; Crosby steam gages; cast-iron brakeshoes and Wabash standard metallic piston and valve rod packings, Wabash headlights, and Wabash air bell ringers. The eight-wheel and mogul engines will have Gold steam heating equipment and Westinghouse-American air brakes; the switching engines will have American outside equalized brakes. The eight-wheel engines will have cast-steel wheel centers, 66 in. in diameter with standard tires; the mogul engines cast steel wheel centers with Latrobe tires, and the switching engines cast-iron wheel centers with Standard tires. The Baldwin Locomotive Works has also received an order to build three Vanclain compound passenger, and five simple mogul locomotives for the road.

CAR BUILDING.

The Lehigh Valley has ordered 500 steel cars from the Pressed Steel Car Co.

The Barney & Smith Car Co. is building six cars for passenger service for the Erie.

It is reported that the Pennsylvania is in the market for 500 box cars of 80,000 lbs. capacity.

It is reported, but not officially, that the Pittsburgh & Western will order 300 freight cars.

The Dominion Coal Co. is reported in the market for 50 steel cars and three passenger coaches.

The Terre Haute & Indianapolis (Vandalia Line), is asking bids on 400 coal cars of 80,000 lbs. capacity.

The Buffalo, St. Mary's & Southwestern has ordered 500 cars from the Michigan-Peninsular Car Co.

The San Antonio & Aransas Pass has ordered eight cars for passenger service from the Barney & Smith Car Co.

The Duluth & Iron Range has ordered 200 ore cars of 60,000 lbs. capacity, from the Illinois Car & Equipment Co.

The Lehigh Valley has placed an order with the American Car & Foundry Co. for building 1,000 coal and box cars, and 20 cabooses.

We are informed, but not officially, that the Cleveland, Cincinnati, Chicago & St. Louis is building some coal cars at its Brightwood shops.

We are officially informed that the Wisconsin Central is not at present considering buying any new passenger equipment, as rumored last week.

The Missouri, Kansas & Texas is preparing specifications and will shortly ask bids for building 2,000 box, furniture and coal cars of 60,000 lbs. capacity.

The contract for the 200 gondola and 10 box cars for the Chicago Terminal Transfer, referred to in our issue of Feb. 17, was about to be let as we were going to press.

It is reported that the 600 box cars for the Minneapolis & St. Louis, mentioned in our issue of Feb. 17, have been ordered from the Michigan-Peninsular Car Co.

It is reported that the Chicago, Milwaukee & St. Paul is considering placing a large order for freight cars to be built outside of its shops, but we have nothing definite or official.

It is reported that the Laclede Construction Co., Security Building, St. Louis, Mo., has ordered 1,000 coal cars for the extension of the St. Louis, Peoria & Northern from the Georgia Car & Mfg. Co.

We are officially informed that while the Pittsburgh & Lake Erie is negotiating for some new freight cars, as noted last week, the details regarding the matter have not yet been settled.

The Montana Coal & Coke Co. placed the order for the 700 cars, referred to in our issue of Feb. 3, with the South Baltimore Car Works. They are being built according to Baltimore & Ohio specifications.

It is reported, but not officially, that the Kansas City, Fort Scott & Memphis has ordered 200 60,000-lb. box cars from the St. Charles Car Co., in addition to the 200 coal cars noted last week and ordered from the Illinois Car & Equipment Co.

On Jan. 20 we noted that the Lake Superior & Ishpeming was considering buying some new freight cars. It is now reported that it has ordered 100 steel hopper bottom cars of 100,000 lbs. capacity from the Pressed Steel Car Co., similar to the 100 ordered some months ago, and noted at the time.

The Detroit & Mackinac has ordered from the Barney & Smith Car Co. the coal cars noted in this column Feb. 10. These cars, of which 150 have been ordered, are for June delivery. They will be of 80,000 lbs. capacity, and 36 ft. long; Westinghouse air brakes, Tower couplers and Sterlingworth brake beams will be used.

The order for 400 ore cars for the Duluth, South Shore & Atlantic, mentioned in our issue of Feb. 3, has been placed with the Wells & French Co., the cars being for June delivery. They will be of 60,000 lbs. capacity, 26 ft. long and 8 ft. wide. They will have Westinghouse air brakes, Trojan couplers, Detroit springs, Common Sense bolsters, Central steel brake beams, Fulton Iron & Engine Works' journal bearings and metal trucks.

The 200 gondola cars ordered by the Kansas City, Fort Scott & Memphis, from the Illinois Car & Equipment Co., on Feb. 18, and noted in our issue of last week, are for August delivery. They will be 34 ft. long, and 8 ft. 8 in. wide, and of 60,000 lbs. capacity. They will have diamond trucks, iron axles, Westinghouse air brakes, National hollow brake beams, Hewitt brasses, Tower couplers, Barreiras draft rigging, French draft springs and Scott bolster springs, malleable iron journal boxes and metal bolsters.

In our last issue we stated that the Norfolk & Western was considering building 500 freight cars at its own shops. We are now officially informed that the road contemplates building in the near future 1,000 hopper bottom coal cars of 100,000 lbs. capacity, with metal underframes and wooden hoppers. They will weigh about 360,000 lbs., and measure 30 ft. 6 in. long inside, 8 ft. 6 in. wide and 10 ft. high. They will have open hearth steel axles 5¼ in. x 9 in., I-beam bolsters, Westinghouse air brakes, diamond trucks, cast iron wheels weighing about 650 lbs., cast iron brake shoes and journal boxes and lids, and N. & W. standard brasses, coil springs and metal brake beams. The plans have not yet been finished, but it is hoped that work will be begun in 30 days, provided the materials can be secured in that time.

In our issue of Jan. 27 we stated that the Mexican Central had ordered 100 box and 100 stock cars from the Mount Vernon Car Mfg. Co.; and 50 coal, 50 flat, and 250 box cars from the Michigan-Peninsular Car. Co. The cars are all to be of 60,000 lbs. capacity, for April delivery. The box cars will weigh about 30,000 lbs., and measure 34 ft. long outside, 8 ft. 9 in. wide outside of sills, and 12 ft. 2 in. high from rail to running board. The stock cars will weigh about 28,000 lbs., of the same length, and measure 12 ft. 6 in. high from rail to running board. The flat cars will weigh about 26,000 lbs., measure 34 ft. long, 8 ft. 10 in. wide, and 4 ft. 2 in. high to top of floor; and the coal cars will weigh about 30,000 lbs., and measure 34 ft. long, 8 ft. 10 in. wide and 7 ft. 10 in. high over sides. The cars will all be equipped with M. C. B. iron axles, cast steel truck and pressed steel body bolsters, Player brake beams, continuous draft rigging, M. C. standard malleable iron journal boxes, with Fletcher lids, Diamond trucks, cast steel wheels, New York air brakes and Trojan couplers. The box and stock cars will have Wagner doors and Drake & Weirs roofs, and the cars being built by the Michigan-Peninsular Car Co. will have Scott springs. Some questions in regard to other specialties to be used have not been fully decided.

The Dallas (Tex.) Rapid Transit Railway Co. will buy some new equipment.

The New Orleans & Carrollton, New Orleans, La., are about to send out specifications for 60 closed motor cars. The motors are to be furnished by the General Electric Co. (See Electric Railroad Construction column.)

BRIDGE BUILDING.

ADDISON, W. VA.—A bridge is being considered across the Elk River, and bonds will probably be issued to cover the cost of building.

BATAVIA, N. Y.—The Assembly has passed a bill appropriating $2,500 for a new highway and bridge in the Tonawanda Indian Reservation, Genesee county.

CHICAGO, ILL.—Bids are wanted April 10 by the Drainage Board for the bascule bridge at Taylor St.

DENVER, COL.—Plans are under consideration by the Street Committee for a bridge over Monument Creek, at an estimated cost of $12,000. H. C. Lowrie, Engineer of Board of Public Works.

EAST MARION, L. I.—Traffic has been stopped by Roadmaster James F. Winters, over the bridge on the road between Orient and East Marion. A new bridge will probably be built.

GREENVILLE, TENN.—According to report, the Southern Ry. will build an iron bridge across Depot St., to take the place of the present wooden structure.

HAVERHILL, MASS.—The Aldermanic Committee on Feb. 21, voted to petition the City Court for a commission to consider the advisability of abolishing grade crossings in that city.

HORNELLSVILLE, N. Y.—An election will be held March 7 to vote on the proposition to issue $3,600 bonds for a new bridge and removal of an old one. F. P. Rathbun, Mayor.

HOUSTON, TEX.—The Commissioners of Gonzales county will receive bids until March 9 for two iron or steel bridges, one across Sandies Creek on the Gonzales and Smiley road, and the other across Peach Creek on the Waelder and Moulton road. W. W. Glass, County Judge, Houston, Tex.

HULL, QUE.—The City Council has requested the Interprovincial Bridge Co. to build an overhead bridge on Laurier Ave. A resolution was passed, giving the City Engineer jurisdiction over all work to be done by the city, and all intending bidders are to submit their plans to him and secure his consent to the material used.

KANSAS CITY, KAN.—(See Electric Railroad Construction column.)

LE ROY, N. Y.—The Buffalo, Rochester & Pittsburgh will probably soon advertise for bids for the bridge which will be built at Haskin's crossing. (Dec. 23, 1898, p. 921.)

LINDEN, TENN.—According to report Perry Company will build several bridges.

LITTLE ROCK, ARK.—The House of Representatives Feb. 17 passed the bill authorizing the St. Louis, Siloam & Southern to build a bridge across White River in Arkansas. (Dec. 23, 1898, p. 921; Jan. 27, p. 70.)

MORGANTOWN, W. VA.—The United States Senate has passed the bill authorizing the building of a bridge across the Monongahela River at Morgantown. (Jan. 27, p. 70.)

NEW YORK, N. Y.—Assemblyman A. C. Brannan's bill authorizing the building of a bridge over the East River from the Borough of Brooklyn, between Fulton ferry and the Navy Yard, and the Borough of Manhattan, the cost to be borne by the city, and calling for the appointment of a bi-partisan commission of six by the Governor, was reported favorably Feb. 21.

Bridge Commissioner Shea has asked $750,000 for the proposed Vernon Ave. bridge over Newtown Creek, and $200,000 for the Grand St. bridge over the same creek.

OMAHA, NEB.—A committee of the Southwest Improvement Club is endeavoring to have a viaduct built across the railroad tracks on 24th st. Andrew Rosewater, City Engineer.

OTTAWA, ONT.—The Minister of Public Works has approved plans of the steel bridge over the canal at Maria St., and tenders are about to be called. (Jan. 20, p. 50.)

PATTEN, ME.—The Patten, Allegash & Northern will require a number of new bridges. (See Railroad Construction column.)

PETERSBURG, VA.—The Richmond, Petersburg & Carolina RR. has petitioned the City Council of Richmond for right of way and for a bridge across the James River. (See Railroad Construction column.)

PILOXI, MISS.—An ordinance has been adopted by the City Council to issue bonds to the amount of $15,000 for the purpose of building a bridge across Back Bay.

PITTSBURGH, PA.—The Allegheny Valley RR. bridge at West Penn Junction was recently destroyed by an ice floe.

RHINELANDER, WIS.—Two steel viaducts for teams, and two foot bridges will probably be built over the Minneapolis, St. Paul & Sault Ste. Marie tracks, at a cost of $6,000.

RIDLEY, PA.—The County Court has been petitioned for a new bridge over Stone Creek on Second Ave., in Ripley Township. Joseph H. Huddell, Linwood, John P. Fenton, Chester, and Frank I. Taylor, Media, have been appointed a jury to report upon this proposed work.

ROSSVILLE, KAN.—A bill has been introduced in the Kansas Legislature permitting Rossville Township to levy sufficient tax for the purpose of building a wagon road bridge across the Kaw River between Rossville and Maple Hill.

RUPERT, PA.—According to report, the Reading Ry. Co. will replace an old wooden bridge on the Catawissa division across the Susquehanna River by a new single-track iron structure, 1,413 ft. long, and having nine spans.

ST. CHARLES, MO.—The Wellston, Creve Coeur & St. Charles RR. Co. has secured control of the new bridge which is to be built over the Mississippi River at St. Charles. This bridge will be used for wagon and street car traffic. (April 1, 1898, p. 242.)

ST. LOUIS, MO.—A bridge at Clark Ave., estimated to cost $151,000, is said to be under consideration.

STOCKTON, KAN.—Two steel bridges, each about 203 ft. long, are to be built across the Middle and the Old Rivers, two miles west of Stockton.

SYRACUSE, N. Y.—A bill has been introduced in the Legislature providing for a special appropriation of $10,000 for a steel bridge across Onondaga Creek at Rich St. A committee of citizens of Syracuse have sent a petition to Albany disapproving of the bill.

UTICA, N. Y.—Bids will probably be wanted shortly for a new bridge to replace the present structure across the Erie at Washington St. (Feb. 17, p. 130.)

WATERPORT, N. Y.—An election will soon be held to authorize an appropriation of $14,000 for a new bridge across Oak Orchard Creek.

WETUMPKA, ALA.—D. D. Askew, City Clerk, is reported as stating that a bill has been passed by the Legislature authorizing the Commissioners of Elmore county to issue bonds to the extent of $50,000 for new bridges.

WICHITA, KAN.—The Wichita & Southern will require a number of new bridges. (See Railroad Construction column.)

WILLIAMSPORT, PA.—Geo. L. Lynch, City Engineer, is advertising for bids for building the city's share of the undergrade crossing of the Philadelphia & Erie RR. at East Third and Pine Sts.

YANKTON, S. D.—W. W. Graham, Norwalk, O., who recently purchased the Yankton, Norfolk & Southwestern Ry., informs us that a combination wagon and railroad bridge will be built across the Missouri River at Yankton. Congress has passed the bill for a bridge across the same river by the Dakota Southern RR.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Pittsburgh, Cincinnati, Chicago & St. Louis—Preferred 1½ per cent., payable March 20.

Pittsburgh Junction.—Two per cent., payable March 1.

Waynesburg & Washington.—Two and a half per cent., payable March 15.

Boston & Maine.—Quarterly, 1½ per cent., payable April 1.

Hamilton (Ont.) & Barton Incline Electric.—Annual, 3 per cent.

Western Society of Engineers.

At a meeting of the Western Society of Engineers, held Wednesday evening, March 1, in the Society rooms, Chicago, Mr. A. V. Abbott, Chief Engineer of the Chicago Telephone Co., read a paper entitled "Electrical Radiation, with Its Application to Signaling Through Space." The paper was accompanied by exhibitions of the working of apparatus which Mr. Abbott has devised.

The Engineers' Club of Philadelphia.

A regular meeting of the club will be held on Saturday, March 4, 1899, at 8 o'clock P. M. The paper will be on "The Engineering of Transmission of Intelligence." Illustrated. By Theo. Spencer.

The Library Committee proposes to establish a Reference Library, composed of recent text books in the various branches of engineering and allied subjects. The committee proposes to solicit subscriptions from the members of the club, to be used exclusively for the purchase of such text books as are deemed advisable.

Engineers' Club of Chicago.

At a meeting of the Engineers' Club Feb. 21, the subject for discussion was, "Are Underground Trolley Railroads Practicable in Chicago?" Mr. Edward B. Ellicott, City Electrician, maintained that with proper construction and equipment, there is no reason why the underground system cannot be used in Chicago as well as in New York and Washington. Stereopticon views were thrown on the screen showing the method of construction in the two cities mentioned. Mr. Ellicott claimed that the objections to the underground system on account of inadequate drainage were not well founded, and cited the experience of telegraph, telephone and electric light companies in support of his position. Mr. J. R. Chapman, Electrical Engineer of the North Chicago Ry. Co., and C. J. Riley, Assistant Superintendent Chicago City Ry., were present and took the opposite side of the discussion. Mr. Chapman claimed that the system had proved so impracticable that European cities have decided in favor of the overhead trolley. The discussion also touched upon the proper insulation of wires and rails and the effect of ground currents on water and gas mains.

American Society of Mechanical Engineers.

At a meeting of junior members of the society, held Feb. 4, in response to a call from the Council, an Executive Committee was appointed to devise and execute a plan for the furtherance of the junior interests of the society. [See Railroad Gazette, Feb. 10, p. 101.] The Executive Committee, therefore, invites all the members of every grade of the American Society of Mechanical Engineers to attend an informal reunion at the Society House, Tuesday, March 7, 1899, at 8.15 P. M.

The object of this and future reunions, should it be voted at the meeting to continue them, will be to give frequent opportunity for the members of the society to meet and become acquainted with each other and to exchange views on professional subjects. At the meeting of March 7 the subject will be presented by Messrs. Gardner C. Sims and W. S. Aldrich, who were assigned to the U. S. S. Vulcan

during the war of 1898. Lantern slide views will be exhibited, and, after the paper, a general impromptu discussion will be in order.

Before adjourning the Committee will more fully explain the hopes of its members, and will ask the meeting to take the opportunity to present its views on the advisability of the movement and to determine upon the best course to be pursued.

Western Railway Club.

The Western Railway Club held a meeting Tuesday afternoon, Feb. 21, at the Auditorium Hotel, Chicago. The M. C. B. Coupler Committee reported progress and a letter from the Chicago Association of General Superintendents in regard to couplers was referred to that committee.

The programme announced in our issue of Feb. 17 was carried out. The first topic discussed was: The Uses of Compressed Air About Railroad Shops, the discussion being based upon three short papers presented by Mr. J. W. Fitzgibbons of the Chicago, Rock Island & Pacific, Mr. W. C. Squire of the Atchison, Topeka & Santa Fe and Mr. B. Haskell of the Chicago & West Michigan. Some difference of opinion developed as to the economy in using compressed air for such purposes as cleaning coaches, painting cars and loading materials. Mr. Delano of the Chicago, Burlington & Quincy suggested that something might be gained by an investigation to determine how much of the compressed air about railroad shops was used in doing work and how much was wasted at leaks in the pipe lines and connections; he stated that his experience with pneumatic signals and switches led him to suspect that the leakage might amount to more than 50 per cent. of all the air compressed. That this point had not been considered by those present may be due to the peculiar way in which the cost of doing work by pneumatic tools is estimated. From figures presented at the meeting it would seem that no account is taken of the cost of compressing the air, the interest on the investment in pneumatic tools, their depreciation and repairs. It was shown that some of the cost figures presented would not stand analysis.

The topical discussion of a better design for a flat car brought out the statement that some of the very long flat cars now being designed cannot be accepted by many of the roads. The discussion as to the advisability of using water to cool hot bearings on cars and locomotives brought out no definite statements.

At the next meeting Mr. E. M. Herr will read a paper on "High Speed Compound Locomotives," and Mr. C. L. Street one on "High Speed Simple Locomotives."

Railway and Telegraph Employees' Political League of Illinois.

A meeting of this organization, which has made considerable headway in Illinois, was held in Chicago, Feb. 24, and was attended by delegates from all the neighboring States. Steps were taken for the extension of the league so as to make it a national organization, the object being to advance the interests of railroads in politics and to oppose legislation hostile to railroad interests; it is the outgrowth of the Sound Money clubs of 1896, and is described as both non-partisan and non-sectarian.

In the evening a large mass meeting was held in the First Regiment Armory, which was addressed by Hon. Chauncey M. Depew. Mr. Depew said, in part:

"It is time that the men who are dependent upon the railroads for a living should look after their interests, as they may be harmed or benefited by legislation. In being political, but not partisan, you have entered upon the right course. The moment a labor, a trade or a charitable or a religious organization becomes identified with the one party or the other, and can be used to promote the interests of party managers and party candidates, its usefulness has ceased. But when people who are united in the same general cause are in politics only so far as to inform legislators, Governors, Congresses and Presidents of their situation, of their rights, of their business and of contemplated wrongs or injuries to them, then they are able to protect themselves." . . . Speaking of State legislation in New York for control of railroads, he said: "After a bitter struggle in our own State of New York, which lasted some years, a railroad commission was established. . . . It required the united strength of the commercial bodies and of the railroads to induce our Legislature, so heated had the public feeling become, to create a railway commission and give it supervisory powers. . . . The New York Central has never resisted any order of the commission. Directly its orders have cost the company hundreds of thousands of dollars a year, but indirectly the benefits to the public and to the company have been incalculable. Every shipper and passenger and employee knows that a two-cent postage stamp will carry his complaint to Albany. The railway question has disappeared from New York politics. Vindictive, oppressive and striking railway bills have disappeared from the Legislature. . . . I believe that the right of railway companies to form associations and to enter into pooling contracts should be granted, but only under the supervision of the Interstate Commerce Commission. I believe in strengthening that Commission, increasing its powers and adding to its dignity, because of the character of the men upon it and of the subjects with which it deals. The Commission should stand next in the confidence of the people to the Supreme Court of the United States. This supervision of pooling contracts takes away the dangers which were apprehended from these combinations. The Government becomes a party to the contracts. The Government judges of their reasonableness before they can be executed. The Government keeps its eyes and hands upon their workings, and modifies or annuls them as the public interests require. Government ownership prevails in Europe. The service is such as would not be tolerated in this country after our experience. The rates are double ours, because the Government finds this an easy way to raise revenues. The employees are virtually in the military service, and are governed by iron rules and discipline. They are the mainstay of the government party in elections, and their places are dependent upon voting as they are ordered."

On the question of pooling he said, in part: "I believe that the right of railroad companies to form associations and enter into pooling contracts should be granted, but only under the supervision of the Interstate Commerce Commission. I believe in strengthening that Commission, increasing its powers, and adding to its dignity, because of the character of the men on it and the subjects with which it deals. The Commission should stand next in the confidence of the people to the Supreme Court of the United States.

"The interstate commerce law was enacted to prevent discriminations, and yet its operation has been to create combinations and trusts, to destroy the independence of the individual and to injure small places and small industries beyond all other agencies combined. Competition is the remedy provided by the interstate commerce law to prevent discriminations. The object of the framer of that law was to stimulate the normal efforts of rival lines to draw business from each other. The Commission and the author of the law now frankly admit that the method has intensified the evils it sought to cure."

This new organization is said to meet with the approval and support of railroad officers as well as employees, and within a few months the Illinois State League has enrolled about 23,000 members, out of about 87,000 men who are eligible for membership. The delegates at Chicago from other states will form similar State organizations, and next year it is proposed to combine and form a National League.

PERSONAL

(For other personal mention see Elections and Appointments.)

—Mr. William B. Depew, brother of Hon. Chauncey M. Depew, Cashier of the Red, White & Midland Fast Freight lines at Buffalo, died at his home in that city Feb. 27, aged 63 years.

—Mr. James P. Whaling, General Auditor of the Wisconsin Central line for many years, died in Milwaukee Feb. 22, aged 83. Mr. Whaling retired from active railroad service about eight years ago, and had been for some time in failing health.

—Mr. Henry M. Keim, who died at his home in Reading, Pa., a few days ago, was born Aug. 16, 1843. Mr. Keim entered the railroad service in 1867 as Secretary and Treasurer of the Southern Pennsylvania Iron Rd. He was at one time Receiver for the Valley RR., now the Cleveland Terminal & Valley. He was also Vice-President and Director of the C., T. & V.

—Mr. William Laird, the head of the famous shipbuilding firm of Laird Brothers, Birkenhead, died Feb. 7. Mr. Laird was born in 1831. His grandfather founded the firm, which was first styled William Laird & Son, and his father, John Laird, was a partner. In 1829 the elder William Laird built his first iron boat, a lighter 60 ft. long, and four years later he built a seagoing paddle steamer of 148 tons. In the years that have elapsed since then the firm has become famous all over the world as shipbuilders, not only for merchant service, but for the navies of various nations.

—Mr. John Kreusi, the Chief Mechanical Engineer of the General Electric Company, died on Feb. 22 last, at his home in Schenectady. His death occurred after an illness of but three or four days. The funeral services were held on Saturday afternoon of last week, and were largely attended. John Kreusi was born in Spercher, Canton Appenzall, Switzerland, in 1843, and went to work in a machine shop at an early age. He found his way to Paris in 1867, the year of the Exposition, and remained there working in various mechanical industries until the outbreak of the Franco-German war in 1870. He then went to London, where he stayed for some months, and finally decided to make his home in the United States, arriving in December, 1870. He soon found a place with the Singer Sewing Machine Company, where he remained until 1872. At this time Mr. Thomas A. Edison, in partnership with Mr. Unger, was manufacturing stock exchange tickers and telegraph instruments, and in 1872 Mr. Kreusi came with him, devoting his time largely to experimental work and designing. Edison's first phonograph was made by Mr. Kreusi in Menlo Park in 1877, from a rough sketch made by Mr. Edison. In 1881 incandescent electric lighting had passed beyond the stage of experiment, and the Electrical Tube Company was formed, with Mr. Edison as President, Mr. Samuel Insull as Secretary and Mr. Kreusi as Treasurer and General Manager, to make and lay underground electric conduits. Mr. Kreusi designed all the Schenectady shops of the General Electric Company which were built from 1886 to 1892. In 1892 Mr. Kreusi succeeded Mr. Insull as General Manager, and in this capacity had charge of the Schenectady works until 1896, when he was appointed Chief Mechanical Engineer of the company. During his long connection with Mr. Edison and the various companies which were his successors, Mr. Kreusi made many important improvements in machine tools.

ELECTIONS AND APPOINTMENTS.

Atlantic Coast Line.—R. S. Anderson has been appointed Train Master of the Richmond Division, with headquarters at Richmond, Va. Effective March 1.

Atlantic & North Carolina.—At a meeting held at Baltimore, Md., Feb. 25, the following Directors were elected: W. M. Webb, L. C. Daniels, J. A. Meadows, J. A. Bryan, T. C. Whitaker, L. Harvey, J. C. Sugg and J. A. Westbrook. H. P. Dortch of Goldsboro was elected state's proxy.

Baltimore & Ohio.—W. H. Harrison, Superintendent of Motive Power west of the Ohio River, has resigned. He is succeeded by I. N. Kalbaugh, who was Superintendent of Motive Power east of the Ohio.

Chicago & Northwestern.—John M. Northmore has been appointed General Agent, with headquarters at Winona, Minn.

Chicago Great Western.—T. N. Hooper has been appointed Freight and Passenger Agent of the Southwestern Division.

Chicago Junction.—J. C. Denison has been appointed Treasurer, succeeding L. J. Dudley, resigned. Effective March 1.

Chicago, Peoria & St. Louis.—We are officially informed that Supt. C. Millard, with headquarters at Springfield, Ill., will assume the duties heretofore performed by H. W. Gays, General Manager of the C., P. & S. L. and St. Louis, Chicago & St. Paul, who has resigned.

Chicago, Rock Island & Pacific.—H. A. Parker, Second Vice-President of the C., R. I. & P., has been appointed General Manager, succeeding W. H. Truesdale, resigned. H. Gower has been appointed Assistant Freight Traffic Manager, and B. E. Boyd, General Freight Agent, succeeding H. Gower.

Columbia Valley.—The officers of this company, referred to in the Construction column, are: President, L. Gerlinger, Vancouver, Wash.; Vice-President, E. L. Canby; Secretary and Treasurer, George W. Stapleton, Portland, Ore., and Chief Engineer, J. W. Covert, Vancouver, Wash.

Erie.—M. W. Maguire, Superintendent at Jersey City, N. J., is to assume charge of the New York and New Jersey Terminals of the Delaware, Lackawanna & Western. J. F. Maguire, Superintendent of the Susquehanna Division, has been transferred to the Eastern Division and is succeeded by W. L. Derr.

Georgia & Alabama.—The notice which appeared in these columns that E. E. Anderson had been appointed General Freight and Passenger Agent was a mistake. Mr. Anderson assumes the duties of Assistant General Freight and Passenger Agent.

Grand Trunk.—B. Stimson has been appointed Locomotive Foreman, with headquarters at Stratford, succeeding C. F. Neild, resigned. J. R. Donnelly succeeds Mr. Stimson. J. Hodgson, Fort Gratiot, Mich.; F. Sutherland, Montreal, Que., and S. King, London, Ont., have been appointed Master Car Builders.

Great Northern.—J. W. Blabon, heretofore Purchasing Agent, has been appointed Western Traffic Manager. W. L. Benham, Western Freight Manager, with headquarters at Seattle, Wash., has resigned.

Illinois Central.—A. C. Beckwith has been appointed Master Mechanic, with headquarters at E. St. Louis, Ill.

Memphis & Monroe.—The officers of this company, referred to in the Construction column, are: President, T. O. Brewer; Vice-President, W. F. Patton; Secretary, R. A. Shotwell; Treasurer, I. Baer; additional Directors, L. H. Goldman, I. Sugar, W. B. Reilly, E. Fudickar and J. S. Handy. The central office is Monroe, La.

Minneapolis, St. Paul & Sault Ste. Marie.—F. C. Batchelder has been appointed Superintendent of the Wisconsin & Peninsula Division, succeeding D. Willard, resigned.

Ottawa & New York.—Henry W. Gays, heretofore General Manager of the Chicago, Peoria & St. Louis, has been appointed General Manager.

Pacific Coast.—L. E. Smith, Superintendent of the Columbia & Puget Sound Line of the P. C., has resigned.

Plant System.—H. C. Prince has been appointed Comptroller. Effective March 1.

Queen Anne's.—Jesse Hennaman, formerly with the Baltimore & Lehigh, has been appointed Auditor and Superintendent, succeeding Arthur Woolford, resigned.

Rio Grande Western.—Richard English has been appointed Division Master Mechanic, with headquarters at Helper, Utah.

Rutland.—R. T. McKeever has been appointed General Passenger Agent, with headquarters at Rutland, Vt., succeeding E. B. Aldrich, resigned.

St. Louis, Chicago & St. Paul.—See Chicago, Peoria & St. Louis.

Seaboard Air Line.—John Skelton Williams has been elected President of the S. A. L. and the Baltimore Steam Packet Co.

Winona, Marshalltown & Southern.—At a meeting of the stockholders held at Marshalltown, Feb. 22, directors for this company referred to in the construction column were elected as follows: N. S. Ketchum, President; George F. Kirby, Vice-President and Treasurer; A. G. Glick, Secretary; C. C. Gilman, Chief Engineer, and A. A. Moore, all of Marshalltown; E. B. Woodruff, Knoxville, and E. S. Fonda.

RAILROAD CONSTRUCTION, New Incorporations, Surveys, Etc.

ARKANSAS ROADS.—Sawyer & Austin of La Crosse, Wis., have made a proposition to the Commercial League of Pine Bluff, Ark., that the Pine Bluff citizens give a subsidy to move their plant from La Crosse to that city, and to build a road from Pine Bluff west about 25 miles to Sheridan.

ATLANTIC, VALDOSTA & WESTERN.—Arrangements have been completed for the terminals at Jacksonville, Fla. Grading has been completed south to Thomas Swamp, about nine or 10 miles from the city limits of Jacksonville. This swamp is being filled in and grading for the entire extension is substantially completed. (Jan. 20, p. 52.)

Application has been made for a charter to extend the line from Valdosta, Ga., northwest about 75 miles to Albany, to increase its common stock from $1,000,000 to $1,750,000 and to issue bonds.

AURORA & CHICAGO.—This company has been incorporated in Illinois, with a capital stock of $300,000, to build a line from Aurora through Kane, Dupage and Cook counties to Chicago. The incorporators and first board of directors are: Henry A. Everett, E. W. Moore, and B. Mahler, Cleveland, Ohio, and Edward Dickinson and Elmer E. Barrett, Chicago. The principal offices of the corporation will be located at Chicago.

BRITISH COLUMBIA ROADS.—Messrs. Gemmill & May of Ottawa, Ont., give notice of application to the next Parliament of Canada, for incorporation of a company to build a line from Ashcroft, B. C., or Kamloops, or from a point between the two, to run north to Barkerville in the District of Cariboo, and thence to Glenora on the Stikeen River.

CALIFORNIA ROADS.—H. Brunner of San Francisco has made a proposition to the Supervisors of San Luis Obispo County for an appropriation of $500 toward the survey of a line from Port Harford, in that county, northeast into the San Joaquin Valley. It is estimated that the road will cost about $3,000,000.

Application has been made to the Board of Supervisors of Ventura County by Henry T. Oxnard for a railroad from the factory site of the Pacific Beach Sugar Co., through the town of Hueneme to the Pacific Ocean.

CANADIAN PACIFIC.—William Whyte of Winnipeg, Manitoba, Manager of the lines west, is reported as saying that many improvements would be made along the line during the present year, including the replacing of wooden bridges with steel structures, and new stations at New Westminster and Sicamous. He is further quoted as saying that the double tracking of the line between Winnipeg and Fort William will be under consideration this year, and that as soon as the snow goes a competent engineer will go over the ground and prepare an estimate of the stock.

CARIBOO-OMINECA CHARTERED COMPANY.—Arrangements are being made, according to report, for a survey of the Ashcroft & Cariboo line from Ashcroft, B. C., north to or near Barkerville in the Cariboo district. (Dec. 2, 1898, p. 867.)

CENTRAL NEW ENGLAND.—Ryan & Kelly of Philadelphia, Pa., have the contract for the extension of this line from Tariffville, Conn., north 15 miles to Springfield, Mass. Grading is to be begun at once and the contract completed by the end of July. (Feb. 10, p. 108.)

CENTRAL OF GEORGIA.—The Directors have determined to build the four-mile spur from Covington, Ga., to the Porterdale Mill, owned by the Bibb Manufacturing Co. of Macon. (Feb. 17, p. 131.)

CHICAGO, MILWAUKEE & ST. PAUL.—Surveys are reported in progress for a new line into Cedar Rapids, Ia., from the Kansas City branch on the west. If built, this would form a cut-off through that city, and probably form the main line instead of the present line through Marion, which is about six miles to the north.

CHICAGO & EASTERN ILLINOIS.—The Chief Engineer confirms the statement that surveys are in progress for the extension of the St. Elmo Division from Marion, Ill., southwest to Cape Girardeau. (Feb. 17, p. 131.)

CHICAGO & NORTHWESTERN.—Mitchell Vincent of Onaway, Ia., has been awarded the contract for a line from Mondamin, Ia., on the Sioux City & Pacific, to run north 31 miles up the Soldier Valley to Ute, to connect with the proposed Boyer Valley line from Sac City. (Dec. 2, 1898, p. 867.)

Surveys are reported in progress for a connecting line from Centerville, S. D., southeast about 60 miles to Sioux City.

CHICAGO, BURLINGTON & QUINCY.—Kilpatrick Bros. & Collins are reported to have received the contract for filling in the Sheep Canyon on the Black Hills Division, near Lincoln, Neb. (Dec. 23, 1898, p. 923.)

CHICAGO, INDIANAPOLIS & LOUISVILLE.—Final surveys are reported completed for the proposed extension from Cloverdale, Ind., southwest about 65 miles via Patricksburg, Clay City and Dugger to Switz City, and it is stated that work is to be begun soon. (Feb. 3, p. 92.)

CHICAGO, MILWAUKEE & ST. PAUL.—The company this season proposes to reduce the controlling grades on its La Crosse division, between Portage, Wis., and Milwaukee, and on its C. C. B. Iowa division, between Marion, Ia., and Sabula. (Official.)

A bill has been introduced into the Minnesota Legislature to compel this company to standard gage its Preston branch from Preston, Minn., east 58 miles to Reno.

The General Manager writes that the company has no intention at present of building a line into Marshalltown, Ia. (Feb. 17, p. 131.)

CHICAGO, MONTELLO & NORTHWESTERN.—The name of this proposed line is to be changed to the Chicago & West Wisconsin. It was organized in Wisconsin in 1896, to build from the east line of Green Lake county west 125 miles to the west line of Juneau county. Preliminary surveys are made and the company expects to begin building early this spring. Subsidy bonds are to be voted under the new title. J. L. Pennifill, of Montello, Wis., is President. (Oct. 23, 1896, p. 746.)

CHICAGO, ROCK ISLAND & PACIFIC.—A committee from Young, Throckmorton and Haskell counties, has waited upon the officers of the Chicago, Rock Island & Texas, seeking an extension from Jacksboro, Tex., west via Throckmorton to Haskell, about 100 miles. The line was recently extended to Jacksboro.

CINCINNATI, HILLSBORO & WELLSTON.—J. W. Jones of Gallipolis, O., who has recently gone over this line, writes that surveys have been made by P. H. Doyle of Columbus, O., Assistant Engineer of the Columbus, Hocking Valley & Toledo. Over $100,000 worth of work done on the line some 40 years ago can be utilized. Until Mr. Jones makes his report on the resources of the territory no further work on the organization will be attempted. Milton McKeehan of Hillsboro, O., is President. (Feb. 17, p. 131.)

COLUMBUS, LIMA & MILWAUKEE.—Track laying has reached a point two miles from Gomer, O., eight miles north of Lima, and as soon as the bridge over the Shawnee River can be built, about March 1, track will be completed to that city. The section under contract is from Lima north 40 miles to Defiance. G. W. Cowles of Cleveland, O., is President, and C. T. Hobart of Defiance, O., Chief Engineer. (Feb. 10, p. 108.)

COLUMBIA VALLEY.—Articles of incorporation were filed in the County Auditor's office at Vancouver, Wash., Feb. 16, for this company, with a capital stock of $3,000,000, to build a railroad from Wallula, Wash., along the north bank of the Columbia River to its mouth. The incorporators are: L. Gerlinger, President of the Portland, Vancouver & Yakima, Vancouver, Wash.; G. W. Stapleton, attorney for the P., V. & Y., Portland, Ore., and E. L. Canby, Vancouver. The officers are given under Elections and Appointments.

DARDANELLE & OKLAHOMA.—This company was incorporated in Arkansas Feb. 24, with a capital stock of $100,000, to build a line from Dardanelle south 18 miles, to connect with the new Choctaw & Memphis connecting line of the Choctaw, Oklahoma & Gulf. The directors are John H. Pope, President; C. B. Cotton, Vice-President; T. E. Wilson, Secretary, and M. Kaufman, Treasurer.

DULUTH, SOUTH SHORE & ATLANTIC.—Preliminary and locating surveys are reported completed for the extension west from a point near Baraga, Mich. The maximum grade is 1 per cent. Building is to be begun on May 1. (Jan. 20, p. 53.)

With reference to a rumored extension from Newtonville, Mich., to new mines on the South range, the General Manager writes that nothing is yet determined.

ELGIN & CHICAGO.—This company has been incorporated in Illinois, with a capital stock of $300,000, to build a railroad from Elgin to Chicago. The officers and directors are the same as those of the Aurora & Chicago, which see.

ERIE & ALLEGHENY SOUTHERN.—A company has been organized under this name to build a road from Erie, Pa., southeast to DuBois, and thence south to Johnstown, on the Baltimore & Ohio, with a branch west from the main line to Franklin, to connect with the Lake Shore & Michigan Southern, the Erie and the Allegheny Valley. The proposed route is similar to that of the Erie Eastern.

ERIE EASTERN.—An ordinance has been introduced into the Council at Erie, Pa., granting this company right of way along certain streets in the city. The company proposes to build from Erie Harbor, Pa., south 20 miles, via Waterford, to Mill Village. J. C. Whitla, of Pittsburgh, is President, and A. L. Tilden, Leboeup, Pa., Secretary. (Jan. 27, p. 72).

ESCANABA & LAKE SUPERIOR.—Surveys are reported in progress for the extension from the Escanaba River northwest to Republic, Mich., about 30 miles. The road was completed late last year from Escanaba to the Escanaba River, 30 miles. (Feb. 10, p. 108.)

GEORGIA NORTHERN.—The General Superintendent writes that the company expects to extend its line from Moultrie, Ga., southwest to Thomasville at a not far distant date. (Feb. 17, p. 131.)

GREAT NORTHERN.—Surveys are reported in progress for the extension from Meyer's Falls, Wash., southwest through the Fruitland Pass to Republic.

GULF & CHICAGO.—The General Manager announces that grading is to be begun shortly on the extension from Pontotoc, Miss., south about 25 miles through Hoolca to Houston. At Houston the line will connect with the extension of the Gulf & Ship Island, now building. (Oct. 7, 1898, p. 732.)

ILLINOIS CENTRAL.—This company has secured right of way to build two tracks along the river front in New Orleans from the upper limits of the city for 5½ miles to the Stuyvesant wharves of that company. These wharves were built about two years ago, and at that time right of way was given on Louisiana Ave., but the right expires in December, this year. The company is compelled to open a street 100 ft. wide, and to make other changes on the water front, which will cost about $400,000. (Jan. 20, p. 53.)

F. A. Masselli, of Pittsburgh, Pa., has obtained a contract for a portion of the Fort Dodge & Omaha extension. (Feb. 24, p. 146.)

JONESBORO, LAKE CITY & EASTERN.—Work is to be begun, according to report, about the middle of March on the extension from Nettleton, Ark., northwest about 4 miles to Jonesboro, and the company expects to have these two towns connected by June 1. The road has been completed from Nettleboro west about 30 miles, via Lake City and Monette to Leachville, and is to be extended to Luxora on the Mississippi River, east about 35 miles at an early date. A. J. Kerfoot, of Jonesboro is General Manager. (Jan. 6, p. 15.)

LAKE ERIE & DETROIT RIVER.—Proceedings have been begun by Elgin county, Ontario, for quashing the by-law which gives this company a bonus of $7,000 for extending its line from St. Thomas to Ridgetown, Ont. (Dec. 2, 1898, p. 868.)

LAKE ERIE & WESTERN.—Press reports state that the Northern Ohio will expend $250,000 this spring making permanent improvements, including reballasting of road and filling in several bridges.

KANSAS CITY, PITTSBURGH & GULF.—Work has been resumed on the terminals at Port Arthur, Tex., which was suspended pending decision of the Supreme Court of Texas. (Dec. 12, 1898, p. 868.)

MANITOBA & NORTHWESTERN.—This company is making application to the Railroad Committee for authority to cross certain branches of the C. P. R., and the Northern Pacific in western Manitoba, and to connect with the C. P. R. further south.

MANITOBA ROADS.—M. B. Jackson, of Brandon, Manitoba, has given notice that application will be made to the Legislative Assembly of the Province of Manitoba at the next session for an act to incorporate, build and operate a line from Portage la Prairie on the Northern Pacific to the C. P. R., to run west north of the main line of the C. P. R., to the western boundary of the Province, with branches to Nespawa or Gladstone, and to Brandon or Carberry; also in the southwest or northwest to the western boundary of the Province.

John A. Mather, solicitor of Winnipeg, gives notice of application to the same assembly to incorporate a company to build from a point west of Langs Valley southwest through Deloraine on the C. P. R., and Waskada to the western boundary of the Province.

MEMPHIS & MONROE.—This company is being organized in Louisiana, with a capital stock of $200,000, to build a railroad from Monroe north through the parishes of Ouachita and Morehouse to some railroad connection across the State line. The officers and directors are given under Elections and Appointments.

MINNEAPOLIS & ST. LOUIS.—Preliminary surveys are completed for the line from New Ulm, Minn., south about 150 miles to the Illinois Central line in Iowa. There are two routes proposed, one by way of Madelia, Fairmont and Emmetsburg, and another by way of Butterfield, Jackson, Spirit Lake & Spencer. (Feb. 17, p. 132.)

MINNESOTA SOUTHERN.—A representative of this company has recently been at Red Falls, Minn., seeking right of way for this company's line. The company was recently incorporated to build from Kansas City, Mo., through Bedford, Corning, Guthrie Center and Sac City, Ia.; Jackson, Windom, Redwood Falls and Wilmer, Minn., to Sauk Center, connecting with the Great Northern at that point. Wm. T. Smith of Des Moines, Ia., is Vice-President. (Dec. 2, 1898, p. 868.)

MISSOURI ROADS.—The Jefferson City Commercial Club is considering the proposition to build a railroad from that city southwest about 150 miles, via Brazito, Spring Garden, Eldon and Humansville to Lamar, connecting with the Missouri Pacific and the Kansas City, Fort Scott & Memphis. J. C. Fisher of Jefferson City is interested.

MISSOURI TERMINAL RAILWAY OF ST. LOUIS.—This company has been incorporated in Missouri, with a capital stock of $75,000, to build terminals at St. Louis. Among the incorporators are Valle Reyburn, L. E. Anderson and John H. Cruse.

MOBILE & OHIO.—At the anual meeting it was decided to subscribe for capital stock in the Mobile & Bay Shore line proposed from a point on the M. & O., between Pritchards and Whistler, Ala., southwest to Alabama Port, or some other point on Mobile Bay, and to Portersville on Mississippi Sound. The stockholders of the M. & B. S. will vote March 7 on a proposition to issue $200,000 bonds. (Feb. 3, p. 93.)

MORO BAY, WARREN & FORDYCE.—This company was incorporated in Arkansas Feb. 21, with a capital stock of $450,000, to build a line from Moro Bay, Bradley County, on the Ouachita River, to run north about 45 miles to Fordyce on the St. Louis Southwestern. The incorporators are J. N. Wheeler, R. M. Childs, W. R. Quinney, J. M. Singer, J. T. Ederington, J. C. Clary and L. J. Burbridge.

NEW ENGLAND.—The Groton extension from Allyn's Point, Conn., south, six miles to Groton, is reported completed to a point a mile below the New London Navy Yard, and trains will be running about April 1. (Feb. 10, p. 108.)

NEW YORK CENTRAL & HUDSON RIVER.—A committee composed of C. R. Holmes, J. G. Cooke and F. L. Dewey of Potsdam, N. Y., is seeking to secure a proposed extension south up the Raquette River about six miles to Hannawa Falls. It is stated that the line is to be built either from Potsdam or from Steam Mill. T. Streatfied Clarkson of Potsdam has offered to give the railroad a long time lease at a nominal rent of as much of his land as needed for right of way in Potsdam.

NORFOLK & WESTERN.—Right of way is being secured, according to report, for the cut-off on the main line, seven miles in length, in the vicinity of Radford, Va.

NORTH CAROLINA ROADS.—The Cleveland Mills Corporation of Cleveland Mills, N. C., is reported considering the building of a railroad in Cleveland County from its mills south about 10 miles to a point west of Shelby, on the South Carolina & Georgia.

NORTHERN PACIFIC.—Robert Young and J. L. Warner, Mining Engineers of Tacoma, Wash., and A. F. Corbin, a mine operator of Roslyn, B. C., have made a proposition to the N. P. to build an extension of the Roslyn branch from Roslyn, Wash., north 12 miles to the Big Salmon le Sac, to tap the new mining distircts of the Cle Eum.

About a mile of track is reported laid on the Clearwater Short Line from Lewiston, Idaho, east 75 miles toward Missoula, Mont. The company has a force of men at work putting in an extra track and bridge across the Potlatch River. (Feb. 17, p. 132.)

NORTHWEST.—Orman & Crook of Pueblo, Col., have the contract for this line from Huntington, Ore., on the O. R. & N., to run north down the valley of the Snake River, 55 miles, to Oxbow and Ballard's Landing, in the Seven Devils mining district. Isaac E. Blake, 11 Broadway, New York, is President. (Dec. 23, 1898, p. 924.

OREGON ROADS.—W. T. Burney and Chas. N. Scott, of Portland, are promoting a line from the O., R. & N., either at Ciarnie or Portland, to run south about 60 miles to Silverton. It is stated that surveys were made over this route some years ago by the Southern Pacific, and more recent surveys have been made by the men interested.

PATTEN, ALLEGASH & NORTHERN.—Surveys are being made for this proposed line from Patten, Me., the northern terminus of the Patten & Sherman line, to run northwest about 70 miles through the counties of Penobscot and Piscataquis. The maximum grade is 1.25 per cent; maximum curve 6 deg. There will be 12 small bridges required, the longest being 100 ft., the others mostly from 10 to 30 ft. long. The bill to incorporate the company is now before the Maine Legislature. The promoters hope to build this year. (Feb. 3, p. 93.) Albert A. Burleigh, President of the Bangor & Aroostock, of Houghton, Me., is interested. Officers are not yet elected. (Official.)

PEMBROKE SOUTHERN.—A special meeting of the stockholders will be held in Pembroke, Ont., March 20, to authorize the directors to issue bonds to the amount allowed by the act of incorporation, or to such other amount as may be decided upon. The line, which was recently completed from Pembroke southwest 21 miles to Golden Lake, is to be extended south about 50 miles further. (Jan. 20, p. 53.)

PENSACOLA & NORTHWESTERN.—The United States Senate has passed the bill giving this company right of way through the United States Naval and Military reservations near Pensacola, Fla. The line is projected to run from Pensacola north about 440 miles to Memphis, Tenn. S. N. Van Praag, of Monroeville, Ala., is President. (Feb. 3, p. 93.)

PENNSYLVANIA COMPANY.—The New Cumberland & Pittsburgh has been granted a charter to build a branch of the Pittsburgh, Cincinnati, Chicago & St. Louis line from New Cumberland, W. Va., north up the Ohio River, and thence east along the river to Phillipsburg, Pa., opposite Rochester. The road has been built as far as Kenilworth, W. Va., 19 miles from New Cumberland, and plans have been considered recently to extend it eastward to Chester, about four miles. It will require about 32 miles more of road to complete it, and surveys have been made for the entire distance.

PHILADELPHIA & READING.—A committee headed by J. B. Miller, of Bernville, Pa., recently called upon the officers of the P. & R., with reference to building a branch from Bernville to connect with that system. It is stated that the Reading proposed to give the right of way on the Union Canal bed and to take stock. The line as projected would run from Bernville southeast about 13 miles along the Union Canal to Reading station. It is estimated that the cost will be about $100,000, of which it is stated Reading parties have pledged themselves to float $50,000 in bonds.

QUEEN ANNE'S.—Wade, Burns & Co., of Baltimore, Md., are reported to have received the contract for the extension north seven miles to Centerville, Md., and also for the new line through Lewes, Del., southeast about six miles to Rehoboth. (Jan. 20, p. 53; Feb. 17, p. 132.)

QUINCY BELT LINE RAILROAD & TERMINAL.—This company was incorporated in Illinois Feb. 20. to build a belt line around the city for the use of all railroads, and especially providing a way for the extension of the Kansas City, Pittsburg & Gulf and for the Quincy, Carrollton & St. Louis, formerly the Litchfield, Carrollton & Western. The incorporators and first Board of Directors are Chauncey H. Castle, Charles H. Williamson, John S. Cruttenden, Lewis S. Boswell, Anton Binkert and Dickerson McAfee, all of Quincy. The principal office is to be at Quincy.

RICHMOND, PETERSBURG & CAROLINA.—Officers of this company have asked the Board of Aldermen of Richmond, Va., for right of way through that city, and for the privilege to build freight and passenger depots. The line as projected is from Ridgeway, N. C., north 106 miles to Richmond, Va. Twenty miles of track is completed from Petersburg south. It is understood that the Seaboard Air Line is back of this road. (Nov. 25, 1898, p. 853.)

RIO GRANDE WESTERN.—The Chief Engineer is quoted as stating that the company has decided to build a branch from Provo City, Utah, northeast through the Provo Canyon toward Heber City. Grading contracts are to be let at once for about six miles.

SANTA ANA & NEWPORT.—Preliminary surveys are reported completed for the extension from Santa Ana, Cal., to Westminster. (Feb. 10, p. 109.)

SANTA FE TERMINAL OF CALIFORNIA.—This company has been incorporated in California, with a capital stock of $1,000,000, to build new terminals of the San Francisco & San Joaquin Valley line of the Atchison, Topeka & Santa Fe at San Francisco. The incorporators are: A. H. Payson (Trustee), W. H. Bissell, I. C. Bush, J. L. Truslow and A. Mackie.

SIERRA OF CALIFORNIA.—The extension into Sonora, Cal., was to have been completed Feb. 25, and it is proposed to make a further extension from Sonora to Angels' Camp, 14 miles. Contracts are let to Tuttletown or Carter, a new town, and work is to be begun on the Angels' Camp branch as soon as this extension is completed. Later a branch will be built to the stone quarry at Columbia. (Feb. 24, p. 146.)

SIOUX CITY & OMAHA.—E. P. Reynolds, Jr., of Wymore, C. W. Conklin of Tekamah and L. F. Wakefield of Sioux City, Ia., in behalf of this company, have made an agreement with Winnebago Indians for right of way across their reservation. The company proposes to build from Sioux City, Ia., to Omaha, Neb., about 90 miles. Right of way has been granted by Congress. (Feb. 24, p. 146.)

SOUTHERN.—An extension is to be built, according to report, from Attalla, Ala., northwest about 65 miles to Decatur, on another line of the Southern.

SOUTHERN PACIFIC.—Orders have been given, according to report, to increase the working force to a thousand men, and to push construction on the gap along the Pacific, between Surf, Cal., and Elwood, about 55 miles. (Jan. 27, p. 73.)

TEXAS NORTHERN.—Application is to be made soon in Texas for a charter to build a road in Grimes county, to run from Anderson, south 12 miles, to Stoneham on the Conroe branch of the Atchison, Topeka & Santa Fe. Later it is proposed to extend the line in the direction of Houston.

TIFTON, THOMASVILLE & GULF.—This company, which was incorporated in Georgia in 1897 to build from Tifton, southwest about 50 miles via Obe and Moultrie to Thomasville, is fighting the charter asked for by the Georgia Northern for its proposed extension from Moultrie to Thomasville. At the time of the incorporation, Charles W. Parrott of Atlanta, Ga., and W. W. Ashburn of Eastman, Ga., were named as directors. (July 30, 1897, p. 547.)

VERA CRUZ & PACIFIC.—Official confirmatioon is received that this company has bought the Agricola RR. from Cordoba, Mexico, to Motzorongo, 42 km. (26 miles), taking possession Feb. 18. The company has under construction 100 km. (62 miles), from Motzorongo to El Hule, and has the road located from El Hule to Santa Lucrecia, 175 km. (109 miles), and from Vera Cruz to Los Naranjos, 105 km. (65 miles). This, when completed, will make 262 miles of road. Alfred Bishop Mason is President, and W. W. Penney, Chief Engineer, both of the City of Mexico. (Jan. 6, p. 16.)

WICHITA & SOUTHERN.—Contracts are to be let May 1 for grading, track laying and bridges on this line from Wichita, Kan, south to Denison, Tex., on the Missouri, Kansas & Texas. Work will be light. Three bridges will be required. (Jan. 13, p. 34.) O. H. Bentley, of Wichita, Kan., is President, and J. B. Dacey of Boston, Mass., is the Eastern representative. (Official.)

WASHINGTON RUN.—An injunction served against this company by the Pittsburgh & Lake Erie to prevent the crossing of that property at grade, has been settled by satisfactory agreement between the two companies, whereby the Washington Run is to cross the Lake Erie property by overhead crossing. The route of the line is from Layton, Pa., on the Baltimore & Ohio, to the mines of the Washington Coal & Coke Company at Stickle Hollow, five miles. Grading has been resumed. E. J. Taylor of McKeesport, Pa., is Chief Engineer. (Dec. 16, p. 904.)

WATERVILLE & WISCASSET.—Ground was to have been broken Feb. 27, for this line from Weeks Mills, Me., north about 15 miles to Waterville. The Richmond & Potomac Co., 55 Broadway, N. Y., has the contract for grading, and Bushey & Son, of Waterville, have the contract for excavation and stone work on the Kennebec bridge. (Jan. 20, p. 53.)

WESTERN AMERICAN COAL.—Track laying is completed on this line from Carbonado, Wash., on the Northern Pacific to the company's mines at Fairfax, seven miles. T. B. Corey of Seattle, Wash., is General Manager. (Dec. 9, 1898, p. 886.)

WEST VIRGINIA & PITTSBURGH.—Joseph Fuccu is reported to have been awarded the contract for building the extension from Camden-on-Gauley, W. Va., south nine miles to Cherry River. The extension will require a tunnel. (Feb. 3, p. 93.)

WHITE PASS & YUKON.—This line has been completed for about 20 miles to the summit of White Pass, an elevation of nearly 3,000 ft. above Skaguay, Alaska. The first cargo of freight was delivered at the summit Feb. 15. The road, when completed, is to extend from Skaguay east over the White Pass to Ft. Selkirk, N. W. T., about 312 miles, with a branch to Atlin. (Jan. 13, p. 34.)

WINONA, MARSHALLTOWN & SOUTHERN.—This company has been organized in Iowa to build a line from Osage, Mitchell County, on the Winona & Western and Illinois Central, to run south about 175 miles, via Allison, Grundy Center, Marshalltown, Newton and Knoxville to Chariton, a junction point of the Chicago, Burlington & Quincy. It is stated that surveys have been completed, and grading will be begun during the spring. The officers and directors are given under Elections and Appointments.

WISCONSIN ROADS.—The Union Construction Co. of Milwaukee, Wis., whose incorporation was noted under Miscellaneous Companies last week (p. 146), proposes to build a railroad from a point on the Illinois State line in Walworth County, to run northwest across the State to a point in Douglas County, probably Superior. The officers of the Construction Co. are: President, C. J. Woods, Minneapolis, Minn.; Treasurer, N. J. Norton, Oconomowoc, Wis.; Secretary, C. T. McElroy, Milwaukee.

YANKTON, NORFOLK & SOUTHWESTERN.—Graham & Roby, railroad contractors at Norwalk, O., confirm the statement that they have bought this property and propose to complete it. The line as projected is 75 miles long, extending from Norfolk, Neb., north to Yankton, S. D. Of this, 45 miles is graded and 25 miles completed. Work was suspended two years ago, but will be pushed to completion as soon as the sale is confirmed and the weather will permit. A combination wagon and railroad bridge will be built across the Missouri River at Yankton. (Railroad News column, Feb. 17, p. 134.)

YAZOO DELTA.—Rails are laid from Ruleville, Miss., north 20 miles to Tutwiler. This line is to form an extension of the Illinois Central. (Jan. 13, p. 34.)

Electric Railroad Construction.

APPLETON, WIS.—The Fox River Valley Electric RR. has secured franchises permitting it to build from Oshkosh and Kaukauna, and to connect with the Citizens' Traction Co. in Oshkosh; the road to be in operation Aug. 1. (Feb. 17, p. 132.)

AURORA, ILL.—The Aurora & Chicago Ry. Co. was incorporated Feb. 24, with a capital stock of $300,000, to build a line from Aurora to Elgin. Elmer E. Barrett, Chicago, is attorney for the corporation.

BILLERICA, MASS.—Walter A. Drucker, owner of an electric light plant at Billerica, will, according to report, build an electric railroad from Billerica to Arlington Heights, via Bedford.

BRISTOL, TENN.—The Bristol Belt Line Ry. Co., which operates 7 miles of electric railroad, will build a new power plant on Shelby St. S. M. Vance, Superintendent and Electrician.

BUFFALO, N. Y.—The Continental Construction Co. of Boston has secured the contract for building the Buffalo, Hamburg & Aurora Electric RR. The work is to be completed by Aug. 1. U. L. Upson, General Manager. (Jan. 20, p. 54.)

CAMBRIDGE CITY, IND.—R. Kenna and O. A. Kepler have been granted a franchise by the City Council for an electric interurban railroad between Hagerstown, East Germantown, Milton, Mt. Auburn and Dublin. It is stated that the company which is to build the railroad is also to build a steel casting plant in Cambridge City.

CARROLLTON, KY.—The route for the Owenton & Carrollton Electric Ry. Co., according to report, has been surveyed. The proposed road will be 40 miles long, and it is estimated to cost $200,000. This company will carry freight as well as passengers. Martin L. Downs of Carrollton is Secretary. (Jan. 20, p. 54.)

CHARLESTON, ILL.—It is stated that the General Manager of the Cleveland, Cincinnati, Chicago & St. Louis, held a conference with a special committee of the Mattoon Business Men's Association March 2, as to the advisability of building an electric railroad between Charleston and Mattoon, paralleling the Big Four for 12 miles. The Charleston & Mattoon Electric St. Ry. Co. was incorporated in the early part of November to build this road. Forbes Holton and M. R. Williams were reported as among the incorporators. (Dec. 30, 1898, p. 939; Jan. 27, p. 73.)

CHATTANOOGA, TENN.—The Chattanooga Electric Ry. Co. has been granted the franchise recently applied for, for extensions and improvements. (Feb. 10, p. 109.)

CHICAGO, ILL.—The West Chicago St. RR. Co. has again petitioned the city in its fight with the West Park Board, to complete its car line on California and Kedzie Aves. The tracks are laid on these streets, the trolley wires are strung and all is in readiness to operate the cars except that the company has not been permitted to build across four boulevards.

The Chicago & Milwaukee Electric Ry. Co. has applied in Evanston for right of way for its road through that place. No compensation is offered. At present this road is operated from Highland Park to Waukegan. (Jan. 20, p. 54; Feb. 3, p. 93.)

CONNELLSVILLE, PA.—The proposed extension from Leisenring to Vanderbilt by the Connellsville, New Haven & Leisenring St. Ry. Co., according to report, will be completed this spring. (Jan. 21, 1898, p. 51.)

DETROIT, MICH.—The capital stock of the Detroit & Pontiac Ry. Co. has been increased from $400,000 to $500,000 for double tracking and extending by single track. (Pontiac, Feb. 3, p. 94.)

EASTON, PA.—The Slate Belt Electric St. Ry. Co., which was chartered last month (Feb. 24, p. 146), has already made application for right of way. Work is to be begun as soon as right of way is secured, and it is proposed to have the road in operation by June 1.

ELYRIA, O.—The Lorain County RR. Co. has been incorporated, with a capital stock of $100,000, to build an electric railroad between North Amherst and Elyria. The incorporators are: Parks Foster, Elyria; D. E. Foster, North Amherst; F. L. Fuller, W. B. Thompson, Daniel Freese and H. G. Reddington. (Feb. 10, p. 110.)

FORT WAYNE, IND.—The Northeastern Indiana Electric Ry. Co., which was incorporated in January with a capital stock of $50,000, has been granted a franchise by the County Commissioners for its proposed road which is to traverse De Kalb County. F. S. Robey, M. E. Griswold, Stephen A. Powers, J. F. Shuman and Nicholas Endsley, the incorporators of this company, are also the incorporators of the Northwestern Indiana St. Ry. (Jan. 27, p. 74.)

FORT WORTH, TEX.—The Glenwood Polytechnic College St. Ry., we are officially informed, is building nine miles of additional line with the company's own forces. J. T. Voss, President. (Feb. 17, p. 133.)

FRESNO, CAL.—Fred E. Sander of Seattle, Wash., according to report, is interested in the project to build a street railroad system in Fresno and vicinity.

GALT, ONT.—The city of Waterloo has subscribed a bonus of $12,000 toward building an extension of two miles to Berlin of the Galt, Preston & Hespeler St. Ry.

GRAND RAPIDS, MICH.—Right of way has been secured in Walker and Grand Haven by Thomas F. Carroll, Joseph Kerwin and David A. Crow, of Grand Rapids, and C. W. Taylor, of Detroit, for an electric railroad, which they propose to name the Grand Rapids, Grand Haven & Western Ry.

HAMILTON, ONT.—The Hamilton, Ancaster & Brantford Electric Ry., formerly the Hamilton, Chedoke & Ancaster Electric Ry., is reported as having secured $300,000 additional capital for extending the line to Brantford. (Jan. 20, p. 54.)

HEMPSTEAD, N. Y.—The Mineola, Hempstead & Freeport Traction Co. was incorporated Feb. 27 to build an 11-mile electric railroad in Nassau County to connect the villages of Mineola and Freeport. The capital stock is $125,000, and the incorporators are: James A. Stiles, Hempstead; Benjamin F. Hamilton, Chas. Hills, Jas. A. MacElhinny, Frank Harrington and John D. Sweeney of New York City.

INDIANAPOLIS, IND.—Another petition for the privilege of building an electric line along Pendleton Pike from Indianapolis to Anderson, was made to the County Commissioners Feb. 16. This petition is by H. W. Bennett, W. P. Herod and F. T. Hord.

JACKSONVILLE, FLA.—The Main St. RR. Co. has prepared an ordinance to have its charter extended for 50 years, and also permission to extend the present lines about two miles.

JERSEY CITY, N. J.—It is proposed to build an electric railroad to connect Morristown and Paterson via Little Falls. This is probably an extension of the North Jersey St. Ry., which has a line running from Newark through Montclair and Caldwell. It is said that work will be begun by June 1.

KANSAS CITY, KAN.—The Kansas City, Lawrence, Topeka Electrical & Power Co., organized some time ago, has applied to the Kansas Legislature for authority to build a bridge across the Kaw River near Osage Ave. It is stated that if this right is granted the road will be built this year. The plan of the company is to build a road from Kansas City through the Kaw Valley to Topeka (67 miles, according to the Santa Fe Route), and across the Kansas River, and also to build a power plant to supply electricity for manufacturing purposes. Both freight and passengers will be carried. This company is capitalized at $3,000,000, and the incorporators are: Edward E. Holmes, James Haggart and A. N. Gossett of Kansas City, Mo.; E. B. Purcell of Manhattan, and Henry McGrew of Kansas City, Kan. C. L. Dobson is attorney for the company. John G. Johns, a railroad builder of Houston, Tex., is said to be the original promoter of this enterprise.

LEBANON, PA.—John A. Rigg, President of the United Traction Co., of Reading, with others, has secured control of the Lebanon & Annville St. Ry., and the Lebanon & Myerstown St. Ry., heretofore leased to the L. & A. Both are now to be consolidated, and the road extended to Palmyra, 10 miles west of Lebanon, and to Wonelsdorf, 7 miles from Myerstown, the present terminus. At Wonelsdorf the system will connect with the road running to Reading. The improvements will cost about $200,000. A new power house is also to be built this spring. Mr. Rigg is President.

LIMA, O.—We are officially informed that the Lima Ry. Co., will build one-half mile additional single track, this being the only work contemplated. E. W. Moore, President.

LONG ISLAND CITY, L. I.—We are officially informed that that portion of the Long Iseland RR. between Far Rockaway and Rockaway Park, about five miles, will be double tracked this spring, and the line will be operated by both electricity and steam.

LOS ANGELES, CAL.—The Los Angeles Ry. Co. has filed a trust deed for $5,000,000 with the Union Trust Co. of San Francisco. Besides liquidating the indebtedness of several of the companies consolidated, part of the money derived from this bond is-

sue will be placed aside for future extensions of the present lines, and for the acquisition of other lines. (Feb. 3, p. 96; Feb. 24, p. 147.)

LYNCHBURG, VA.—Work on the extension of the Lynchburg & Rivermont St. Ry. was begun Feb. 28. This extension consists of 1¾ miles of overhead trolley system. (Nov. 25, 1898, p. 853.)

The Lynchburg Electric Ry. & Light Co. will begin work on the proposed extensions and rebuilding the line about March 10. (Jan. 13, p. 34.)

MANCHESTER, N. H.—The Manchester St. Ry has a petition before the State Legislature for extensions on Franklin St., and for permission to make other improvements.

MASSENA, N. Y.—Attorneys Berry and Crapser give notice to the City Council that another corporation, to be known as the Massena Traction Co., will soon ask for a franchise to build through Massena. This seems to be a rival to the Massena St. Ry. Co., incorporated Feb. 6. The Massena St. Ry., besides operating a railroad in Massena, proposes to build an electric light and power plant, and has also incorporated the Massena Water Co. J. L. Hyde and M. H. Flaherty represent the Massena Electric Light Co. (Feb. 10, p. 110.)

NEW ORLEANS, LA.—The New Orleans & Jefferson RR. Co. has petitioned the city for an extension of one year from March 11 for building the line on Napoleon Ave., in the city, and to finish the whole road in two years. If this is not done, the company is to forfeit a $20,000 bond. Thomas W. Castleman, President. (March 18, 1898, p. 209.)

J. K. Newman, President of the New Orleans & Carrollton RR. Co., informs us as follows as to the work to be done by his company: Ten miles of single track is being rebuilt with 100-lb. T-rails supplied by the Pennsylvania Steel Co.; the rebuilding of overhead system will require about 150,000 lbs. of copper feed wire and various overhead line materials. An Allis engine and one 850 k. w. G. E. generator have been purchased. The road is being extended three miles by single track. The contracts to be let will be awarded as soon as bids on the specifications, now being sent out, are in. Work will probably be begun by May 15. The track construction will be done under the supervision of the company's engineers, Messrs. Ford, Bacon & Davis. (Feb. 10, p. 110.)

NEWTOWN, PA.—Geo. C. Worstall, Secretary of the Newtown Electric St. Ry. Co., informs us that the 14-mile extension which the company is building to Doylestown, will be placed in operation before long. (Sept. 23, 1898, p. 697.)

OSHKOSH, WIS.—The Citizens' Traction Co. has secured all necessary franchises and right of way for its road to Neenah, and will soon let contracts for material, etc., for the road. This company will connect with the Fox River Valley Electric RR. in Oshkosh. Geo. J. Kobush, President. See Appleton, above. (Jan. 20, p. 54.)

OTTAWA, ONT.—The Ottawa & Pontiac Ry. Co. has petitioned the City Council of Hull for permission to build additional lines.

PASADENA, CAL.—An ordinance has been passed by the City Trustees granting to Geo. B. Leighton the right to build and operate an electric street railroad in specified streets in Pasadena.

PEEKSKILL, N. Y.—Again it is reported that the Peekskill Traction Co. is about to build its proposed 12-mile electric railroad, having let the contract to Sanderson & Porter of New York. This company was incorporated last April, Hanford Smith of Peekskill and Jack Larrsch of New York City being among those interested.

PHILADELPHIA, PA.—The Philadelphia, Morton & Swarthmore St. Ry. Co. was incorporated Feb. 23, with a capital stock of $150,000, to build a line 1¾ miles long, connecting the boroughs of Collingdale and Glenolden, via Darby. The incorporators are: J. Paxton Lance (President), William G. Powell, S. Fowler, Henry A. Noble, of Philadelphia, and Ashley R. White, of Haddonfield, N. J.

The Southwestern St. Ry. extension from Second and Jackson Sts., to Bow Creek, a distance of about 15 miles, with a spur of a mile and a half long, was formally opened Feb. 28. (Aug. 12, 1898, p. 587.)

PITTSBURGH, PA.—The Monongahela Incline Co. gives notice that within 60 days a change of ownership will take place, and that the passenger incline will be changed to carry electric cars, and the freight incline will be arranged with a cabin so that passengers and teams can be carried at the same time. The Incline Co. is capitalized at $150,000, and it is said that the Consolidated Traction Co. of Pittsburgh has secured an option on a majority of the stock.

PORT CHESTER, N. Y.—D. E. Cummings, Superintendent of the Port Chester Electric Ry. Co., informs us that the company expects to extend the road in several directions this season. (Dec. 23, 1898, p. 924.)

QUAKERTOWN, PA.—The Quakertown Traction Co. has been granted right of way for its road through Doylestown. (Dec. 30, 1898, p. 939.)

RIVERSIDE, CAL.—Frank A. Miller, General Manager and Purchasing Agent of the Riverside & Arlington Ry Co., informs us that the work of rebuilding the road is now finished. The company now operates seven miles of electric and 1½ miles of horse road. (May 27, 1898, p. 383; Jan. 6, p. 17.)

SAN JUAN, PORTO RICO.—J. G. White & Co., New York, inform us that in addition to changing the present seven miles of road of the San Juan & Rio Piedras RR. to electricity, about 1½ miles additional is to be built.

ST. LOUIS, MO.—L. J. Howard of the Evans & Howard Clay Fire Brick Co. is reported as endeavoring to revive a franchise granted in 1889 for an elevated railroad to form a belt line around the city. The franchise was to the Rapid Transit Ry. Co. of Missouri, in which Mr. Howard, with others, were the principal stockholders.

SCOTTDALE, PA.—The Mt. Pleasant, Scottdale & Connellsville Electric Ry., with a capital stock of $400,000, was incorporated Feb. 23, to build a line 28 miles long through Fayette and Westmoreland counties. The officers of the company recently elected are: President, W. E. Tustin, Allegheny; Secretary, G. S. Lewis, Crafton; Treasurer, H. C. Fehl; General Manager, W. W. Staub, of Pittsburgh. At West Newton this road will connect with the Second Avenue Passenger Ry. of Pittsburgh. (Feb. 10, p. 110.)

SHERBROOKE, ONT.—The Sherbrooke St. Ry. Co., operating about 7 miles of electric road, is reported sold to F. Thompson & Co., of New York City. Many improvements and extensions, it is reported, are contemplated, and the Montreal & Southern County Ry., which has a charter between Montreal and Sherbrooke, will probably connect with this road. John W. Burke, of 45 Broadway, New York, is President.

SPOKANE, WASH.—The City Park Transit Co. has made application for an extension of the Lidgerwood Electric Line from Hillyard to Couer d'Alene, about one mile. (Feb. 17, p. 133.)

SYRACUSE, N. Y.—A contract for building the Syracuse, Lakeside & Baldwinsville Ry., from Pleasant Beach to Baldwinsville will soon be let. Material for the road has already been ordered and partly delivered. This company recently purchased the lake branch of the D., L & W. RR., which runs from Pleasant Beach to Long Branch, which will be changed to electricity. (Feb. 17, p. 133.)

TACOMA, WASH.—The Seattle & Tacoma Electric RR. Co. is the name of the electric railroad which Henry Bucey is about to build between these places, a distance of 20 miles, by the Northern Pacific Ry. This company is also empowered to build and maintain telephone and telegraph lines and to supply electric current for manufacturing purposes. The maximum rate of fare for round trip between Seattle and Tacoma will be $1, and the plan is to make the trip in 45 minutes. The company is capitalized at $600,000, and it is expected to have cars in operation by Nov. 1. (Feb. 3, p. 94.)

The Cedar River Water Power Co., with which E. H. Amidown, of Tacoma, is connected, according to report, is soon to be incorporated as the company to supply the power for an electric railroad to build from Tacoma. Malcolm McDougall, who was recently granted a franchise for the road through Kings county, and who has now an application for the continuation of the road through Pierce county, is also connected with this project. This is probably a part of the plan to build between Seattle and Tacoma. It is said that Eastern capitalists are interested.

UNDERCLIFF, N. J.—The Bergen County Traction Co. has completed its line from Fort Lee to the Hackensack River, and the first car was run over it Feb. 22. (March 11, 1898, p. 189.)

VANCOUVER, B. C.—The British Columbia Ry. Co. has made an agreement on a percentage basis for 11 years with the City Council for an extension by double track over the Davie St. line to English Bay. The company is endeavoring to have its main line franchise, which expires in 1918, extended for 50 years. The company has recently added to its plant two new cross-compound Corliss engines, purchased from the Laurie Engine Co., of Montreal, and air pumps, condensers, etc., from the Northey Manufacturing Co., of Toronto. Beginning with March, drawings will be made at the rate of £2,400 per annum to redeem the registered bonds of 1897. (Dec. 30, 1898, p. 939; Feb. 17, p. 133.)

WASHINGTON, D. C.—The House bill, which authorizes the extension of the Maryland Suburban Ry., was brought before the Senate Feb. 21. The Maryland Suburban is a Maryland corporation, which proposes to build an electric railroad from Takoma Park, about 3 miles from Hyattsville, Md., a few miles from the District line, to the District of Columbia, and then operate over the tracks of the City & Suburban Ry. Oscar T. Crosby is President of both companies. (Dec. 23, 1898, p. 925; Feb. 3, p. 94.)

The plans of the Columbia Ry. Co. for replacing its cable system by underground electric have been approved by the District Commissioners. (Dec. 23, 1898, p. 925.)

WESTERLY, R. I.—William C. Clarke of Wakefield is reported interested in a project to build an electric railroad between Westerly and Point Judith, and thence to Narragansett Pier. C. V. Cooper, Engineer of the Sea View Ry., and Mr. Clarke are about to make a survey for the proposed road.

WILLIMANTIC, CONN.—It is reported that Ames L. Hathaway, F. W. Lord and Leslie C. Ward, all of Boston, are planning the purchase of the franchise of the Willimantic St. Ry., and to build the road. (Dec. 23, 1898, p. 925.)

WOODBURY, CONN.—The Woodbury & Southbury Electric RR. Co. is the company which proposes to build between the places named via Hotchkissville.

GENERAL RAILROAD NEWS.

ALEXANDER & RICH MOUNTAIN.—Dr. G. A. Newlon and H. C. Duncan, Jr., were appointed receivers of this company on Feb. 16. Operation has been suspended for some time, but Dr. Newlon states that the company expects to have the road in operation again soon. The line runs from Alexander Junction, W. Va., to Rich Mountain, 23 miles. It is a logging road, and has been operated in connection with the Alexander Lumber Co. The capital stock is $75,000, and other liabilities $50,000.

ATLANTIC & NORTH CAROLINA.—A bill has been introduced into the General Assembly of North Carolina, authorizing the sale of $1,266,500 stock of this company owned by the State, at a price not less than $300,000. The stock outstanding is $1,797,100, but while the State owns about 70 per cent., it is authorized to cast only about one-third of the votes. The law further provides that the holders of the private stock shall have the privilege of depositing their stock at the same price per share as is paid for that of the State.

CENTRAL PACIFIC.—The syndicate gives notice that a majority of the capital stock has been deposited under the plan of agreement of Feb. 8, and that the time of further deposit, without penalty, has been limited to and including March 23. They call upon holders of Speyer & Co. certificates of deposit for a cash payment of $2 per share, payable on or before April 6 under the foreclosure plan. (Feb. 24, p. 147.)

Holders of certificates of the Central Trust Co. on Feb. 27 adopted resolutions authorizing the New York Stockholders Committee, of which August Belmont is Chairman, to accept the plan of reorganization. A similar resolution was recently adopted by the London stockholders.

CHICAGO & ALTON.—President Blackstone states that, according to his latest advices, less than one-quarter of the stock has been deposited at the offer of $175 per share for common stock and $200 per share for the preferred. He has issued the following communication to stockholders:

In my communication addressed to you under date of the 31st of January I made certain statements with reference to an offer made by Mr. J. J. Mitchell to purchase your shares. I now wish to supplement that statement by advising you that in case a majority of the shares of the company are not sold to the syndicate, represented by Mr. Mitchell, I shall advise that you authorize the refunding of the outstanding bonds of the company and the issue of a stock dividend to represent earning heretofore invested in permanent improvements. (Feb. 3, p. 95.)

CHICAGO & WESTERN INDIANA.—Ninety-five first mortgage bonds of 1879 are called by J. P. Morgan & Co., New York, for redemption on May 1, at 105.

CHICAGO, BURLINGTON & QUINCY.—At a special meeting of the directors, held at Boston Feb. 23, it was decided to raise $5,000,000 for improvements and new equipment, and to issue $16,000,000 in new bonds with which to buy the Chicago, Burlington & Northern and the Keokuk & Western, and to liquidate the Ottawa, Oswego & Fox River Valley 8 per cent. bonds, which fall due in 1900. Francis W. Hunnewell, Chairman of the Finance Committee, makes the following statement:

The directors voted to buy the Keokuk & Western Railroad, 250 miles long, in Iowa and Missouri, and practically in the Chicago, Burington & Quincy territory. As a 3½ per cent. bond on the property of the Chicago, Burlington & Quincy east of the Mississippi River (practically all the company's property in Illinois and Wisconsin) may be considered as worth par, it is explained, the directors have practically agreed to raise $16,000,000 from stockholders by giving them a bonus of $4,000,000 in Chicago, Burlington & Quincy stock. As this stock is worth nearly $6,000,000, the Chicago, Burlington & Quincy stockholders get a plum this year of the value of 6 per cent. in addition to their 6 per cent. cash dividend. The amount of Chicago, Burlington & Quincy stock outstanding is $88,635,100. There will be no general refunding scheme extending beyond the Mississippi River.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has bought from the Chicago Ry., Terminal Elevator Co., the Fulton and St. Paul elevator property on the Chicago River, between Lake and Kinzie St., Chicago. The Fulton property is 147 ft. x 107 ft., and the price was $262,000. For the St. Paul elevator the price paid was $138,000, not including the ground, which is owned by the RR. Co.

COLUMBUS, HOCKING VALLEY & TOLEDO.—This property was sold at foreclosure Feb. 24, to the reorganization committee for the upset price of $3,250,000. The real estate and other property of the company went to the same bidders at $750,000, the upset price. (Jan. 27, p. 75.)

The reorganization mangers give notice that the final installment under the reorganization plan of $3.75 on each share of preferred, and $2.50 on each share of common stock is payable at 23 Wall St., New York, March 20. An agreement has been made with J. P. Morgan & Co. to extend the first mortgage sinking fund bonds of the Columbus & Hocking Valley (which matured Oct. 1, 1897, and have been extended under the receivership), from April 1, 1899, to Oct. 1, 1948, with interest at $5 per annum. J. P. Morgan & Co. are ready to buy at par and interest at 6 percent. to April 1, 1899, less discount at the rate of 2 per cent. per annum, any of the bonds which holders may wish to sell.

COLUMBUS, SANDUSKY & HOCKING.—H. M. Butler of Columbus, O., on Feb. 20 was appointed Master to take account of the indebtedness of this company. He asks that all claims and accounts be proved before him on or before April 5. (Dec. 9, 1898, p. 887.)

EASTERN RAILROAD IN NEW HAMPSHIRE.—The Boston & Maine has petitioned to the Board of Railroad Commissioners for approval of the purchase of this line, which runs from Portsmouth, N. H., to Seabrook on the Massachusetts line, 16.08 miles. It is leased to the B. & M. for 60 years and two months from Oct. 1, 1878, at a rental of $22,600 per annum.

KANSAS, OKLAHOMA CENTRAL & SOUTHWESTERN.—The Atchison, Topeka & Santa Fe has acquired this property now building from a point near Caney, Kan., to Bartlesville, Ind. Ter., with several projected spurs.

KINGSTON & PEMBROKE.—In the case of Folger vs. K. & P. Ry., before Judge Price, an order was granted for the distribution to the stockholders of the surplus moneys, amounting to $20,000, in the hands of receivers. This, with the recent issue of preferred stock, it is stated, will place the company in a solid condition. (Jan. 27, p. 75.)

MANHATTAN ELEVATED.—The stockholders on Feb. 28, voted to accept the proposition to increase the capital stock from $30,000,000 to $48,000,000, to provide funds for substituting electricity and for other improvements. (Feb. 10, p. 111.) The State Railroad Commissioners March 1 approved of the increase of the capital stock.

MOBILE & BIRMINGHAM.—The Southern has negotiated a 99-year lease of this road, to take effect March 1. The M. & B. runs from Mobile, Ala., to Marion Junction, 149.4 miles, with trackage on the Southern from Marion Junction to Selma, 13.1 miles. It is stated that there is to be no change at present in the management.

OHIO SOUTHERN.—Judge Hubbard on Feb. 24 confirmed the sale of this road to the bondholders, after reversing a former decision of the court, making allowances under the receivership which were objected to as excessive. The property was sold Oct. 15, 1898. (Jan. 13, p. 35.)

ST. LOUIS, CHICAGO & ST. PAUL.—Judge Allen, in the United States Circuit Court at Springfield,

Ill., on Feb. 16 authorized Receiver William H. Male to issue $400,000 receiver's certificates, to bear 6 per cent. interest, for the payment of claims for labor, material, taxes and improvements. Only $200,000 will be issued at once. (Oct. 7, 1898, p. 734.)

ST. PAUL & DULUTH.—At the meeting of the stockholders held Feb. 20, the directors were authorized to buy the Grantsburg branch from Rush City to Grantsburg, Minn., 17 miles, and also the two leased lines, the Taylor's Falls & Lake Superior, from Wyoming to Taylor's Falls, Minn., 20.5 miles, and the Stillwater & St. Paul from White Bear, Minn., to Stillwater, 12.5 miles. All these lines have been operated by the S. P. & D., and no change in management will be necessitated. (April 22, 1898, p. 302.)

SIOUX CITY, O'NEILL & WESTERN.—Judges Sanborn, Fair and Adams, in the Federal Court of Appeals at St. Louis, Mo., on Feb. 21, affirmed the order of the lower court granting a decree of foreclosure to this company and the Sioux City & Northern on petition of the Manhattan Trust Co., New York. They denied the right of intervention to E. H. Hubbard, assignee of the Union Trust Co., an insolvent corporation at Sioux City, Ia. (Jan. 13, p. 36.)

SHERMAN, SHREVEPORT & SOUTHERN.—A bill has been favorably reported in the Texas Legislature, authorizing the Missouri, Kansas & Texas to consolidate with the S., S. & S. The M., K. & T. recently offered $150,000 of first mortgage bonds of the S., S. & S., which were guaranteed by the M., K. & T. (Jan. 27, p. 75.)

SONORA.—An agreement has been executed between this company and the Southern Pacific and ratified by the Mexican Government leasing the Sonora to the S. P. The S. P. has leased to the Atchison, Topeka & Santa Fe the line of the Sonora from The Needles to Mojave, Cal.

UNION PACIFIC.—The New York Stock Exchange has authorized the listing of $19,204,700 additional Union Pacific common stock, and an additional $8,255,000 when issued. This is in exchange for the common stock of the Oregon Short Line. (Feb. 3, p. 95.)

UNION PACIFIC, CENTRAL BRANCH.—Holders of Union Trust Company's certificates of deposit for the Atchison & Pike's Peak first mortgage 6 per cent. bonds, and for Central Branch U. P. funded coupon 7 per cent. bonds, will receive a final payment of 7½ per cent. upon the surrender of the same to the Trust Co. (Oct. 21, 1898, p. 770.)

VIRGINIA & SOUTHWESTERN.—This company was incorporated in Virginia, Feb. 22, with a capital stock of $3,000,000, as successor to the South Atlantic & Ohio. The property was sold under foreclosure April 26, 1898, to the bondholders for $205,000. The plan of reorganization contemplates an issue of $1,000,000 first mortgage 5 per cent. gold bonds, due March 1, 1949, with interest from March 1, 1899. The incorporators are: George L. Carter, president, Pulaski, Va.; Benjamin L. Delaney, Bristol; Elverton R. Chapman, Melville D. Chapman, Casper H. Eicks, New York. The S., A. & O. runs from Bristol, Tenn., to Big Stone Gap, Va., 71.09 miles. It was opened May 1, 1890, and a receiver was appointed Aug. 8, 1892. (May 6, 1898, p. 334.)

WISCONSIN CENTRAL.—The latest report as to the reorganization plan calls for an issue of $26,000,000 4 per cent. bonds, $11,500,000 preferred stock and $15,500,000 common stock. It is stated that the general 5 per cent. bonds will receive 70 per cent. in new 4s, and about 40 per cent. in new preferred. The income bonds and preferred stock will be assessed 20 per cent., the bonds receiving four shares of new preferred and 4½ shares of new common stock, while the preferred stock will receive four shares of new preferred and two of new common. The old common stock will be assessed 10 per cent. and receive four-tenths of a share of new common. (Dec. 30, 1898, p. 940.)

Electric Railroad News.

AKRON, O.—The United States Court has ordered the postponed sale of the Akron St. Ry. & Illuminating Co., to be held March 28; the property is appraised at $695,000. (Dec. 30, 1898, p. 940.)

ANDERSON, IND.—The Elwood Electric St. Ry. Co., which, by May 15, will have 5½ miles of road completed, will be operated from that day by the Union Traction Co., of Anderson, which recently bought the property. (See Elwood.)

BUFFALO, N. Y.—A consolidation of the entire street railroad system of Buffalo and five suburban lines is reported about completed. The roads involved in the consolidation are the Buffalo Ry. Co., the Buffalo Traction Co., the Buffalo & Niagara Falls Electric Ry., the Buffalo, Bellevue & Lancaster Ry., and the Niagara Falls Park & River Ry. The latter company is a Canadian corporation, operated between Chippewa and Queenston, Ont. In addition to the purchase of these electric roads, a new syndicate which, according to report, will have a capital of $25,000,000, has secured control of the Niagara Falls & Clifton Bridge Co., and the new suspension bridge which the Lewiston Connecting Bridge Co. and the Queenston Heights Co. are now building at Lewiston. (Feb. 10, p. 109.)

DALLAS, TEX.—C. F. Freeman, Manager of the Dallas Rapid Transit & Terminal Ry. Co., which was sold Nov. 1, informs us that the present owners on Feb. 21, reorganized and formed a new company, the Rapid Transit Ry. Co. The officers of the old company were re-elected, with the exception of Geo. D. Hartson, Superintendent, who was superseded by William Burd. (Nov. 18, 1898, p. 840.)

DOYLESTOWN, PA.—The Doylestown Trust Co. has been appointed receiver in the suit by John B. Stevenson against the Bucks County Ry. Co. (Jan. 27, p. 76.)

ELWOOD, IND.—Ellis C. Carpenter, Secretary of the Union Traction Co., Anderson, Ind., informs us that his company having purchased the city lines in Elwood from the Elwood Electric St. Ry. Co., will take possession May 15, by which time 5½ miles of unfinished road between Alexandria and Elwood will be completed. (Jan. 13, p. 36.)

EXETER, N. H.—The New Hampshire Legislature has passed the bill to charter the Exeter, Hampton & Amesbury St. Ry. Co., with a capital stock of $250,000, as a consolidation of the Exeter St. Ry., the Hampton & Amesbury St. Ry. and the Rockingham Electric Co. The consolidation involves about 23 miles of street railroad and a large lighting plant. The new company will connect Exeter and Portsmouth, N. H., and Newburyport and Amesbury, Mass., with an electric railroad. (Feb. 10, p. 111.)

FORT WAYNE, IND.—Judge O'Rourke, Feb. 20, rendered a decree ordering Receiver A. L. Scott of the Fort Wayne Consolidated RR. to sell the property to the highest bidder. A motion for a new trial in the bond case, involving the late James J. Shipperd of Cleveland, former President of the company, was overruled. The road is 31 miles long. (July 22, 1898, p. 540.)

FORT WORTH, TEX.—The Fort Worth St. Ry., and the City Ry. have been consolidated. Morgan Jones, Vice-President and General Manager of the Fort Worth & Denver City Ry., owns a controlling interest in the new company. Wm. P. Quigg, heretofore Superintendent of the City Company, will be Superintendent of the consolidated companies.

INDIANAPOLIS, IND.—The parties who recently purchased the Citizens' St. Ry. Company's stock and the franchise of the City Ry. Co., will incorporate a new company as the Indianapolis St. Ry. Co. Hiram B. Wasson has been selected as President. Among the Directors are: Harold B. Hibben and Dr. Henry Jameson of Indianoplis, Randall Morgan of Philadelphia and Hugh McGowan of Kansas City. (Jan. 27, p. 76.)

IRONTON, O.—Joseph J. Welsh, Manager of the Ironton Electric Light & St. Ry. Co., Edward C. Hoyt and John Hamilton, representatives of the Knickerbocker Trust Co., have applied for a receiver for the former company, also for the foreclosure of a mortgage of $300,000.

LOGANSPORT, IND.—Geo. J. Marrott, President of the Indianapolis & Logansport Traction Co., and Chas. Dwyer of Indianapolis have bought the Logansport St. Ry. for $100,000, of which $20,000 was paid down and $80,000 of indebtedness assumed. The road has been in the receiver's hands since July, 1895. The Indianapolis & Logansport Traction Co. is gradually securing right of way for its proposed line. (Feb. 10, p. 110.)

MARLBORO, MASS.—The Marlboro St. Ry. Co. has petitioned the Railroad Commissioners for authority to lease the Framingham, Southboro & Marlboro St. Ry. at a guaranteed dividend of 6 per cent. on the stock of the latter company. Treasurer Philip L. Saltonstall, 53 State St., Boston, is conducting the negotiations for the Marlboro St. Ry.

MILWAUKEE, WIS.—The Milwaukee Electric Ry., according to report, assumed control of the Milwaukee, Racine & Kenosha Ry. Co. on March 1.

NEW ORLEANS, LA.—A circular has been issued by J. K. Newman, President of the New Orleans & Carrollton RR. Co., stating that this company has bought the franchises and property of the Canal & Claiborne RR. Co., the sale having taken place Feb. 9. The C. & C. is capitalized at $240,000, and has a bonded mortgage indebtedness of $800,000 at 6 per cent. The road is 56 miles long, operated both by horse and electricity.

NEW PALTZ, N. Y.—E. E. Hawkins has been appointed Superintendent of the New Paltz & Walkill Valley Ry. Co., under the receivership of Edward Bowen. (Jan. 20, p. 56.)

OAKLAND, CAL.—Suit has been brought by E. C. Sessions and T. L. Barker to have A. L. Barney removed as receiver of the Highland Park & Fruit Vale Ry. Co., which is now controlled by the Realty Syndicate operating the Oakland Transit Co. The petition filed states that Mr. Barney, who is at present Acting Secretary of the Realty Syndicate, has not managed the affairs of the H. P. & F. V. in the interest of the stockholders. (July 22, 1898, p. 540.)

PETERSBURG, VA.—Messrs. Middendorf, Oliver & Co., Baltimore, and John L. Williams & Sons, Richmond, Va., who recently bought the property of the Piedmont Traction Co., and the Virginia Traction Co., have formed the Petersburg Ry. & Electric Co., which is a consolidation of all the street railroads and electric light companies of Petersburg. The new company is capitalized at $500,000, and bonds to the amount of $1,500,000 have been authorized, though only $500,000 will be issued at present. (Sept. 16, 1898, p. 680; Feb. 24, p. 148.)

PORTLAND, ME.—At a meeting Feb. 20 the stockholders of the Portland RR. Co., ratified the purchase of the Portland & Cape Elizabeth Ry. Co. Control of the Cape road was assumed by the Portland 10 days after the ratification. (Feb. 24, p. 148.)

PLYMOUTH, MASS.—The Brockton St. Ry., according to report, has secured control of the Plymouth & Kingston St. Ry., and hereafter the two will be operated as one company.

QUINCY, MASS.—The Quincy & Boston St. Ry. has a petition before the Railroad Commissioners for authority to purchase the Braintree St. Ry. Co., a trolley road with a capital stock of $200,000, operated by the Q. & B. since October, 1895. The plan of absorption contemplates an exchange of five shares of Q. & B. stock for six Braintree shares.

RUTHERFORD, N. J.—The purchasers of the Union Traction Co. of New Jersey, which was sold at auction Jan. 27, have organized under the name of the Newark & Hackensack Traction Co., and the following have been elected as the officers: G. W. McCormick, President; W. C. Giles, Vice-President; John H. Coon, Treasurer. (Feb. 3, p. 96.)

ST. LOUIS, MO.—Stockholders of the Broadway Cable Line met on Feb. 22 to discuss a proposition for the absorption of the lines of the National Ry., the Southern Electric and the 65 per cent. of the Broadway Cable stock formerly controlled by the Hamilton syndicate. James Campbell, Christian Peper and John I. Taussig have been appointed a committee to look after the minority interests. Other reports are that this consolidation is to have a capital stock of $80,000,000, and that there will be a bond issue of $40,000,000 of 4 per cent. general mortgage bonds, of which about $22,000,000 will be used in the purchase, and $18,000,000 reserved to retire existing bonds of the various roads as they fall due. The present bonds amount to about $18,000,000, bearing interest at 5 per cent. and 6 per cent. It is proposed to name the new company the Union Depot Railway Company System.

Special Commissioner C. C. Moffit, Feb. 24, ratified the sale of the People's Ry. Co. to August Gehner, L. M. Rumsey and Charles Parsons for $500,000 on behalf of the third mortgage bondholders on Feb. 10. (Feb. 17, p. 134.)

WATERTOWN, N. Y.—Edward N. Smith, referee appointed to sell the property of the Watertown & Brownville St. Ry., under the foreclosure suit, has filed his report. There are two separate actions, the first being bonds and interest due, amounting to over $86,000; in the second action the foreclosure is for $40,000 bonds and interest due. The W. & B. is now the Black River Traction Co. (Dec. 31, 1897.)

TRAFFIC.

Traffic Notes.

The Common Pleas Court at Columbus, O., has granted a temporary injunction against the ticket brokers of that city, restraining them from dealing in reduced-rate round-trip convention tickets.

Investigation of Export Grain Rates, by I. C. Commission.

Upon statements filed by the Chicago Board of Trade, the Interstate Commerce Commission has ordered an investigation of rates on corn and other grain to New York and other North Atlantic seaports on shipments for export. The hearing is to take place in Chicago on March 9. The Board of Trade resolutions state that St. Louis and other Mississippi River points have usually taken rates to the seaboard which were 116 per cent. of those from Chicago, but that the lines east of the Mississippi have recently put in at Mississippi River points export rates on corn originating west of that river which are less than those from Chicago. To New York the export corn rate from St. Louis is now 13½ cents on shipments from points west of the Mississippi, while from Chicago it is 16 cents. This is claimed to unjustly discriminate against all producers and all shippers at points east of the Mississippi. The competition of carriers to New Orleans and other Gulf points is the justification claimed by the railroads for the lower rates on corn coming from west of the Mississippi, but the Board points out that similar competition exists on corn produced in Illinois along the line of the Illinois Central. It is also alleged by the Chicago Board that like discrimination exists in export rates on flour. Over thirty roads are made defendants by the investigating order.

State Regulation of Freight Rates in Texas.

Two of the Texas Railroad Commissioners, Chairman Reagan and Mr. Mayfield, have given to the newspapers their views on the compromise between the railroads and the state (which was reported in the Railroad Gazette Feb. 24, p. 143). Judge Reagan says the compromise slightly increases rates, but makes no change in cotton, lumber, flour, wheat, oats and hay. There is a small increase, being about 3 per cent. The Judge says the compromise will save $10,000 or $15,000 court expenses, and that the people will be relieved from the effects of the excessively high rates now being enforced. "I believe it is the best thing that could have been done for the railroads and the people. Their relations and interdependence are so blended as to demand fairness and good will of both sides."

Commissioner Mayfield dissents from the views of the other Commissioners, and says: "During the past eight years, the only period of time of which this Commission has trustworthy information, it appears there has been, upon the whole, a reasonable and steady increase in the gross and net earnings of the railroads of this state, as well as those connected with this litigation. It is generally admitted by disinterested individuals that the freight tariffs promulgated by this Commission and enjoined by the Federal Judge at Dallas, were not in any respect unjust or unreasonable to the railroad interests.

"There is abundant evidence in this office establishing the facts that some, if not all, the roads involved in this litigation have for a long period of time and to an enormous extent paid rebates, transported various commodities for favored shippers at rates below any tariff ever promulgated by this Commission, or openly published by themselves, and have in manifold ways improperly diverted the earnings of their properties. Indeed, in this latter respect, some are so bold in their abuses as to practically admit the charge from this office that a portion of their earnings have been appropriated to certain political campaign funds and the purchase of 'free coinage catechisms.' As suggested by Governor Culberson in his last message, the state should take care that no law is enacted that tends to consolidate and strengthen the power of these railroads. The state should proceed promptly and energetically to institute the proper proceedings looking to the forfeiture of the charters of each of these railroad corporations."

Chicago Traffic Matters.

Chicago, March 1, 1899.

Chicago and Peoria grain shippers are in a fancied stew over what they term a discrimination in export corn rates against these two cities in favor of Mississippi River points. Commissioner Yeomans has conferred with the transportation committees of the boards of trade of the two cities, and a hearing will be held.

Officers of the Western lines are stirred up over the actions of the Great Northern and Northern Pacific roads in announcing very low rates for two home-seekers' excursions to be run March 7 and 21. The rates announced are from Chicago to north Pacific Coast points, $63.50 for the round trip, against the present regular rate of $110; and $37.50 one way, compared with the regular fare of $61.50. Officers of competing roads have agreed to meet the round trip rate, but to ignore the one-way cut. This agreement applies to only the first excursion, rates for the second to be considered at a future meeting.

A majority of the general passenger agents of the roads west of this city are opposed to any increase in the size of the present 2,000 mile interchangeable mileage book. There has been some demand for a 3,000 ticket.